two or more in a house for the use of the family and of visitors.

Chauki.—Low wooden stools about 18″ to 2′ square. One or more are kept in every house and are used for the same purpose as *machuls* and occasionally for bathing.

Pinrā.—Rectangular pieces of wood about an inch in thickness of various sizes, used for sitting on during meals.

Khāts and *machuls* are sometimes very neatly made with dressed *sāl* wood frames on turned legs with the rope-work artistically woven with string of coloured jute or hemp in fancy patterns. Clothes and bedding are, when not in use, kept on a rope or bamboo or wooden pole stretched from wall to wall, or on wooden pegs projecting from the walls. Shelves of various lengths of wood or plastered dab wattle, resting on pegs driven into the walls, are placed rather above a man's height from the floor for keeping cooking pots and cooked food. Oil, *ghi* (clarified butter), *murhi* (fried rice), *chinra* (dry parched rice), *gur* (molasses), etc., are kept in earthen pots or jars suspended from the roof in string loops, sometimes very artistically made of coloured strings. Valuable things (such as silver ornaments, cash, documents, rent receipts, etc.) are kept inside earthen pots imbedded in a wall, or buried in the floor in places known to the head of the family only. Wooden and tin boxes are gradually coming into use amongst well-to-do people chiefly for keeping clothes and valuables.

Earthen pots of various sizes are used for cooking purposes but there are generally also an iron *karāi* (a semi-spherical pan with two loop handles) used for boiling milk and frying purposes; and a *loki* (a shallow brass pot) specially used for cooking for guests, who for caste reasons require their food separately cooked.

Other utensils in daily domestic use, of which there may be one or several in a house according to the circumstances of the owner, are:—

1. *Garayā* or *Gharā* (water-pot of brass cast or wrought).
2. *Thālā* or *Thāli* (circular dinner plates of various sizes with more or less raised edges).
3. *Ghati* (small sized pots for drinking water).
4. *Galās*, *i.e.*, glass (tumblers for drinking water).
5. *Bāti* or cup, ranging from one holding an ounce or two to large bowls holding a gallon or more.

Nos. 2 to 5 are mostly of bellmetal, but small sized brass cups are also used. Stone pots, dishes and bowls of different sizes and varieties manufactured at the quarries in Pātkum are also used.

Dress.

The ordinary apparel of the cultivating classes consists of the following made in local looms for the most part from imported cotton yarn. (1) *Kācha*—5 to 7 cubits in length and about 1 cubit wide. This is passed between the legs and under a piece of string round the loins; over this the *kāchā* is wrapped once or twice, according to its length, so as to leave a piece about 18 inches in length to hang loosely downwards from the loins. (2) *Gāmcha*—This is about 5 cubits in length by 2 cubits in width, worn in various ways; when working in the field or walking long distances in sun and rain half of it is tied on the head, turban fashion, leaving the other half to hang down to cover the back and sides. It is also worn over the *kācha* and loosely turned round the waist and tied in a knot or else loosely wrapped round the body. (3) *Dhuti*—The ordinary *dhuti* a longer piece (7 to 8 cubits) of about the same width as a *gāmchā* reserved as a rule for use on special and festival occasions. (4) *Gelāp*—This is a two-fold wrapper of about 5 cubits in length and 3 in width, sewn to that size from stuff especially made for the purpose, and used as a wrapper in the winter season, both when going out or sleeping (5) *Bādha*—Wooden sandals used only in the rainy season when going about and not when working in the fields.

The umbrella (*chhātā*) of common use is made of split bamboo ribs and shaft with covering of fine bamboo mat. Imported or country-made umbrellas of European fashion are now generally used by well-to-do cultivators. The *ghong* is a covering for the head and back in one, woven out of leaves of a creeper of that name which grows in the hills. The portion for the head tapers to a point and rests on the head hat like, the remainder spreads round to cover the arms and back down to a little below the waist. The lower edge is semi-circular. It is used mostly by women, especially when working in the fields during the rains, and by ploughmen.

Female swear the *thenti* which is a stout piece of cotton cloth with a border on the two long sides, and varying from 5 cubits by 1¼ cubits for young girls to 10 cubits by 2 cubits for grown-up women. This is turned and tied round the waist, forming a kind of skirt, and the remaining length passed over the shoulder, so as to cover most of the upper part of the body and, when necessary or desired, the head. The ordinary *thenti* is plain but coloured cloth is not infrequently used, and the borders worked in various patterns; the portion at one end, which is thrown over the left shoulder, called the *anchla*, is also occasionally worked in some fancy pattern.

Younger girls are clothed in pieces of cloth, plain or striped, just large enough to go comfortably round the waist and to hang down to the ankles; these are called *puth* or *pharān*. Similar but rather larger pieces of cloth called *nahanga* are used in the same manner by very old women.

European cotton-clothes, coats, shirts, vests, etc., are gradually coming into use amongst those who have opportunities of frequent intercourse with advanced people living in centres of trade and industry and near railway stations.

Bedding.

The ordinary bedding consists of a mat made of palm or date palm leaves and split bamboo. *Kāntha* made of old and useless clothes sewn quilt fashion, sometimes with coloured thread, form the best mattresses in most houses, and these are also used by old women as wrappers during winter. Country-made blankets and *durries* (Satranja) are also fairly common. Straw is abundantly used in winter for sleeping on, either on a *khāt* or on the floor. Pillows for the head are generally made by placing bundles of straw underneath the mat, *kāntha* or blanket. Ordinary pillows made of silk cotton, stuffed inside a cotton-cloth casing, are also occasionally used.

Village Festivals.

Apart from the usual ceremonies in connection with births, deaths and marriages, which vary according to the race, religion and caste of the villagers, the main feature of village social life is the observance of the various festivals of which almost every month has its own particular one. The following account of the most important of these, other than the regular Hindu festivals recognised and observed by the strictly orthodox, has been furnished by Rai Nanda Gopal Banerji Bahadur; the festivals described represent for the most part semi-Hinduised survivals of what were originally the non-Hindu festivals of the different animistic tribes, or else regular Hindu festivals to which various aboriginal forms and ceremonies have been tacked on.

Bysakh.—*Sārul* is observed on the last day of the month of *Bysakh* (April-May). The *Lāya* or village priest offers flowers and sacrifices a cock, or less frequently, a goat or sheep, in the *grāmya thān*, *i.e.*, the seat for the presiding deity of the village. The Sonthals and Bhumij offers various kinds of jungle edibles to the deity and brew *hānriā* or rice-beer and spend the night in dancing, men and women together, to the accompaniment of the *mādal*. The Kurmis abstain from both drink and dance and merely decorate the entrance to their houses, and do not work on that day. If there is any death or birth in the village, the festival is postponed for a more auspicious day. This festival is obviously a survival of the *baha bonga* or flower festival of the Hos and the *sârul* of the Mundas described by Col. Dalton, though these are held slightly earlier in the year. They mark the bursting of the trees into new leaf and blossom, and the beginning of spring.

Joistha.—The *Rohini* festival is observed on the 13th day of the month of *Joistha* (May-June). Pujas are offered to Manasa, the deity presiding over snakes, and a band of cow-dung is smeared around every house and enclosure wall. The young men and boys go about the village dancing, rubbing mud and throwing dust at each other.

Ashar.—The last day of the month of *Ashar* (June-July) is devoted to the *Jântal Parab* or *Ashari Grâm Puja* (the *baihar horo nawai* of the Sonthals) when the first fruits of the new crops are offered to the presiding deity of the village. A goat is sacrificed by the Lâya at the *grâmyâ thân* and the meat distributed to all families, cultivators abstaining from work in the fields for the day.

Sraban.—Manasa is again propitiated on the last day of *Sraban* (July-August) with offerings of goats, geese or pigeons.

Bhadra.—In *Bhadra* (August-September), on the 11th day of the bright half of the month, are celebrated the *Karam* and *Ind* Pujas A branch of the *karam* tree is planted in the *akhra* (meeting place) and offerings are made by a Brahman who gets some rice or paddy and pice from every family as his fees. The day as well as the preceding night are spent in fasting but in the evening every one meets at the *akhra* and dancing round the *karam* occupies the night. Next day Indra, the special deity who presides over the rains, is propitiated with the sacrifice of a goat, branches or twigs are planted in the paddy fields, the transplantation of which ought by this time to be complete, and the *chhâtâ* (umbrella) ceremony is then gone through. For this a big *sâl* pole topped with an umbrella, with bamboo ribs and shaft covered with white cloth, and ornamented with flower frills and tassels, has been previously prepared and pivoted on a framework of vertical *sâl* posts fixed in the ground, with ropes arranged for hauling the umbrella on its long shaft into an upright position. On the arrival of the zamindar on horseback or in a *pâlki* preceded by a horseman, the umbrella is rapidly run up and the zamindar and his cortege make the circuit of the pole seven times amid the shouts and applause of the crowd, which then disperses. A similar festival is observed in some localities under the more descriptive name of *Chhâtâ Parab* on the last day of the same month. Both the *Ind* and the *Chhātā* festivals are closely connected with what may be called the semi-feudal zamindari system of the district, and the celebrations take place only at present or past headquarters of one or other of the local Rājas, and by way of imitation, of one or two wealthy Kurmi landholders. These festivals mark the completion of the transplantation of the lower land rice, and the beginning of the harvest of the early *gora* rice. The *karam* festival referred to in an earlier part of the chapter is, however, more generally celebrated by Sonthals and other aboriginals in this district later in the year, at the end of *Aswin*, when the reaping of the main rice crop begins.

Aswin.—The *Jita Parab* takes place on the 8th day of the dark phase of the moon in *Aswin* (September-October). This is observed for the benefit of children by females who are mothers, and widowers with children The green end of a sugarcane, a branch of a fig tree and a small bundle of green paddy plants are fixed in the place selected for the purpose in the village. Those who observe the ceremony fast the whole day and night, and *puja* is offered to Bhagabati Durga. At night there is the usual dancing and merry-making.

Kartik (October-November).—The *Garayā puja* is observed on the 15th day of the dark phase of the moon in *Kartik.* The usual *Kāli puja* drinking and dancing begin in the evening and the drums are kept going all night "to keep the cattle awake." Pujas are offered inside the cattle-shed the next morning for the propitiation of the goddess Bhagabati Durga and a she-goat is generally sacrificed. The following day, *i.e.*, the second day of the light half of the month is the *Kārā Khūnta.* On this occasion the horns of the buffaloes (both male and female) and of the cows and bullocks are smeared with oil and vermilion and various devices daubed on their bodies. In the afternoon selected buffaloes and bullocks are tied with strong ropes to different posts close to each other along the main street of the village These are then frightened and scared by constant drumming and the display of red cloth, blankets and even bear and tiger skins, till they break their ropes and bolt away.

Aghan (November-December).—The succeeding month *Aghan* or *Agrahayan* is not marked by any special festival of the type just described.

Paus (December-January).—In *Paus* the *Tusu Parab* is observed by unmarried girls throughout the month. Small cowdung balls are prepared, and stored in an earthen pot, which is painted outside with a solution of pounded rice. Paddy is sprinkled over the balls, and *pujas* offered to the goddess of wealth with flowers of mustard and radish every morning before anything is eaten. Hymns are also sung invoking the goddess and calling on her to provide wealth and good husbands. On the last day of the month the girls bathe, set fire to the cowdung balls and join in the general *Pitha* or cake festival. This is celebrated by the whole village bathing very early in the morning, preferably in some large river, and on their return eating cakes prepared a day or two before of pounded new rice, and stuffed with a paste of cocoanut or cocoanut and *gur*.

Magh (*January-February*).—On the succeeding day, the first of *Magh*, held to be specially auspicious, all cultivators take an early bath and, having tied the yoke to the plough with a new piece of rope, go out to one of their fields and take the plough two-and-a-half times round it. They then return home and take their breakfast and then turn out in bands and go about merry-making, cock-fighting, singing, dancing, etc.

Phalgun (*February-March*).—In *Phalgun* the orthodox Hindu festival, the Holi or Phāgua, is celebrated by all classes alike and takes the place of any special local festival.

Choitra (*March-April*).—In *Choitra*, on the last day of the month and also of the Bengali year, is celebrated the *Bhokta* or *Charak* hook-swinging festival, referred to earlier in this chapter. This, though essentially a festival in honour of the Hindu Mahādeva and organised by a Brāhman priest, is most popular with some of the aboriginal and semi-aboriginal castes, and the devotees are almost invariably drawn from among these classes, the higher castes and orthodox Hindus being content to look on.

Besides or as alternatives to some of the above, the Sonthals and Mundas observe the ordinary festivals peculiar to those tribes; no attempt need be made here to describe these as they differ in no important particulars from the same festivals as observed in the districts of the Sonthal Parganas and of Rānchi, and are fully described in the volumes of this series dealing with those districts.

Pastimes. Apart from the dancing, singing and too often drinking which, as will be seen, usually form a leading feature of the numerous religious or semi-religious festivals that follow one another at frequent intervals throughout the year, and constitute the chief amusements of the people, the most characteristic pastime is hunting. From their earliest years all aborigines use bow and arrow partly as a pastime and partly, when this is still possible, as a means of obtaining food. Besides the annual regular hunt or *Hānkwa* (*lo bir sendra*) of the Sonthals for which they gather in large numbers from all parts of the district south of the Dāmodar at Ajodhya on the Bāghmundi range of hills, and in the north of the district on the slopes of Parasnāth, smaller hunts are frequent in the wilder areas, and almost everywhere the boys pursue with great zeal any jackal, fox or hare that may be sighted near the village with their dogs, their bows and arrows, and sticks and stones. Arrow shooting matches are not uncommon, and form an essential part of the *Binda Parao* of the Bhumij and of the *Akhan Jatra* which corresponds to the *Pitha Parab* or cake festival as observed by the Kurmis. Over a great part of the district, and more especially in the south and east, cock-fighting is a very favourite amusement; this usually takes place on market days after the main business of the day is over, and takes the form either of individual matches or more rarely regular inter-village matches, over which great enthusiasm is displayed. The cocks are specially bred and trained for the purpose, and rough pieces of iron, three inches or more in length, with an edge hammered and ground till it is of knife-like sharpness, are attached to the spurs. The contests are usually fought to the finish and the beaten bird goes as the prize to the owner of the winner. Among the Bhumij in the west a kind of hockey (*Phuni khel* or *Phudi inganu*) is played with considerable zest in the month of January, large numbers taking part in the game which is played with any ordinary sticks and a ball of raw hide stuffed with cloth. The object of the game is to drive the ball over the opponent's goal line (there is no actual goal) which is usually formed by some natural boundary. Other games are marbles, and one resembling 'tipcat', and in the south of the district 'pegtops' are occasionally seen.

CHAPTER IV.

PUBLIC HEALTH.

GENERAL CONDITIONS.

MĀNBHUM enjoys the reputation among both Europeans and Indians of being a particularly healthy district; considerations of temperature indeed make Rānchi and Hazāribagh preferable to Europeans as places of residence but Purūlia is still, in spite of the accessibility of Rānchi, a favourite health resort among certain sections of the Indian population. The fact that the whole country is undulating and towns and villages are usually built on comparatively high lands, ensures a certain amount, at any rate, of natural drainage, and with it a relative immunity from the ordinary diseases, which account for the bulk of the mortality elsewhere. Statistics of mortality fully bear out the popular reputation, the mean ratio of deaths per mille of population, for the quinquennial period ending 1907 being returned at 25·37 only, as compared with the provincial average of 35·53, the only districts boasting a lower mortality rate being Singhbhum with 21·25 and Sambalpur with 24·29.

But the Sanitary Commissioner's figures show that there has been a gradually falling off in late years in the comparative immunity of the district from fever, the ratio of deaths from that cause having gone up from 15·73 for the ten years ending 1902 to 19·74 for the succeeding five years, and the district has also earned of late an unenviable reputation for severe epidemics of cholera and small-pox. These epidemics usually mark the hot weather months, April to June, recurring from time to time in the case of cholera in August and September. Ordinary fever is most prevalent at the seasons of excessive variations of temperature which mark the months of March and early April, and again the end of the rains, September and October, which is also the most favourable period for malarial fevers. The hot weather proper is usually, apart from epidemics of cholera and small-pox, a healthy period, as also are the cold weather months except for the old and for persons of otherwise impaired vitality. All three Municipal towns compare favourably with the rest of the district in point of view of mortality, and in contrast to the mufassal area the figures for the five years ending 1908 show a considerable improvement on those for the decennial period ending 1902; in Purūlia the ratio of deaths decreased from 23·13 to 20·89, in Raghunāthpur from 26·85 to 20·88 and in Jhalda from 22·55 to 17·96, the corresponding figures for the district as a whole being 22·45 for the earlier period and 28·13 for the later.

Vital Statistics.

The present system of collecting statistics of births and deaths both in urban and rural areas was introduced in 1892; compulsory registration is in force in the towns and parents, guardians or the persons directly concerned are required to report births and deaths to the town police. In rural circles each village chaukidar is required to report at the time of the weekly parade at the police stations all births and deaths which have occurred in his village, or the portion of the village in his charge, during the preceding week. In the towns the statistics so collected are checked not only by the police but also by the vaccination staff working under the direct control of the Civil Surgeon; in rural areas the chaukidar's reports are from time to time verified by a superior police officer. The area of a thana or police circle is ordinarily, however, considerable and the amount of control which can be exercised over the chaukidars is necessarily small; the reporting staff is moreover illiterate and ordinarily of no very high level of intelligence, and not given to displaying any inordinate amount of energy over this or any other branch of their work. It follows that registration and classification of diseases are much less accurate in rural areas than in the towns where the general level of intelligence is higher, and the supervision closer. The chief defects in vital registration are the omission to report still-births, births of females, and births in outlying hamlets and among the lowest castes. Deaths are more carefully recorded but the causes of death, except perhaps cholera and small-pox, are hopelessly confused, the bulk being classified under the general head of fever.

Births.

The returns from 1892 to 1908 show that since 1895 the birth rate has generally been above 30 per mille, the average for the ten years ending 1902 being 32·78, and for the five years ending 1908 it was as much as 39·11. The lowest ratio recorded was 25·91 per mille in 1895; in more recent years the lowest reached was 31·47 in 1908. The highest rate recorded was 44·51 per mille in the year just preceding, and this extraordinary drop in the birth rate, though to some extent due to incomplete registration, can only be fully accounted for as the result of two successive years of short crops and high prices with resulting reduced vitality, and the very considerable emigration of women as well as men during the period of scarcity. As is usually the case elsewhere the ratio of births is lowest in the towns, Purūlia showing for the five years ending 1908 an average of just over 20 per mille, and in the preceding ten years only 18·33. For the same periods in the town of Raghunathpur the ratio of births fell from over 29 to 23 per mille, and in Jhalda from over 27 to 25·65. The highest ratios of births were generally in the areas in which the aboriginal element, more especially the Sonthals whose fecundity is proverbial, is strongest; the lowest rate is curiously enough found in Jharia, where a large part of the enumerated population is a floating population of mining coolies, and apart from the fact that the women naturally make for their own homes, if possible, before confinement, the registration both of births and deaths is necessarily more difficult and more inaccurate than elsewhere.

Deaths

The death-rate during the same periods was lowest in 1898 when it fell as low as 16·43, a figure partially accounted for by the large amount of emigration in the preceding year; 1899 and 1900 were also years of low mortality, the ratios being just over 20 and 21 respectively. Since then there has been a fairly steady rise culminating in the high figure of 41·78 per mille in 1908, when cholera alone accounted for nearly 10 per mille, and the mortality from fever exceeded the ordinary average of deaths from all causes, the predisposing cause being undoubtedly the low vitality resultant on two years of comparative scarcity and high prices. This is clearly shown by the figures showing age at death; of 54,375 deaths 8,949 or 16·46 per cent. were of infants, 6,940 or 12 76 per cent. of children between 1 and 5 years of age, and 6,515 or 11·98 per cent. of persons of 60 years and upwards; over 41 per cent. of the deaths in all being children of tender years or the extremely old.

Infantile Mortality.

Infantile mortality even in ordinary years is high though on the whole Manbhum compares very favourably with many districts in the province. In 1906 something less than 16 per cent. and in the following year slightly over 16 per cent. of children born in the district died within 12 months of their birth, as contrasted with over 20 per cent. in 1908: another 10 to 15 per cent. die between the ages of one and five. More male infants die than females and the feverish and early cold weather months, September to December, are especially fatal. In the rural areas, given normal conditions, there is no reason why infant mortality should be specially high, the climate being ordinarily dry and the villages naturally drained. Conditions in the larger villages and towns and in the coal field areas, where large numbers of coolies live more or less crowded into a very small space with inadequate sanitary arrangements, are not conducive to child life.

Diseases. The great bulk of the mortality is reported as due to fever, the ignorant chaukidar for the most part being incapable of distinguishing more than three specific causes of death (other than death by misadventure); cholera he knows, small-pox he knows, all others he treats as due to fever.

Fever. The average mortality from fever for the five years ending 1908 was 19·74 per mille as compared with 15·73 per mille for the ten years ending 1902; in the urban areas the variation was in the way of decreased ratios; Purūlia showing a small improvement from 8·44 to 7·83, Jhalda rather more from 13·94 to 10·82 and Raghunāthpur a very marked decrease from 17·98 (more than the district average) to 11·82 per mille. Major S. Anderson, I.M.S., Civil Surgeon of the District, writes, "in the rural areas there has been a marked increase in the death-rate, the ratios having gone up from 14·39 to 27·19 during the quinquennial period ending 1908. The year 1908 records the largest number of deaths, almost double that of 1904, as previously noted, the ratio of deaths for the district from this cause, having gone up from 15·73 for the ten years ending 1902 to 19·74 for the succeeding five years. The increase is noticeable in all the thanas of the district. Thanas Para, Chāndil, Barābazar (Bandwān side), Topchanchi, Tundi and Jharia persistently recorded an annual increase in the death-rate. From this it would appear that the most malarious portions of the district are the forest country at the foot of the hills, and especially the rice-growing tracts.

"The figures shown under head 'Fever' practically represent the residue of deaths from all causes after abstracting a certain number of deaths from small-pox, dysentery, &c., owing to sheer ignorance on the part of the registering agents. Further I am of opinion that a large percentage of the cases of this disease are imported. Mānbhum possessing a dry climate and being within easy reach of Calcutta, is resorted to, every year, by a large number of health-seekers and patients suffering from malaria, enlarged spleen and phthisis.

"The meteorological data also bear some relation with the prevalence of malaria, as it has been noticed that a heavy rainfall together with high level sub-soil water, occurring mainly at the foot of hills—as in Topchānchi, and at Dalma in the Barābazar thana—favours malaria. The water here forms pools quickly, which remain for a long period, and so allow of multiplication of the mosquitoes carrying the fever.

"*Seasonal prevalence.*—Apart from epidemics of cholera and small-pox, which occur from April to June, 'fever' due to various causes is most prevalent in March and early April and again in September and October at the end of the rains. In February and March a form of 'Influenza' prevails, mainly a catarrh attended with slight fever and frontal headache.

"Simple fever mainly due to heat occurs during the dry hot months of April, May and June; this when more severe causes syncope (failure of heart), difficulty in breathing or acting upon the thermal regulating centres produces the so-called 'Siriasis' of Manson.

"True malaria occurs from August to October, but 'relapses' may occur at any time."

Cholera.

Cholera is endemic in this district, the average death-rate during the five years ending 1908 being 2·91 per mille, as compared with an average of 1·58 in the preceding 10 years. The latter figure may be taken as representing the normal death-rate, as the second period includes 1908 in which the death-rate from cholera reached the exceptional figure 9·27 per mille, the maximum recorded for the district for any year for which statistics have been compiled. In this year the enormous number of 12,075 deaths were recorded, and even this figure probably falls far short of the actuals as the coal field area in Jharia and Topchânchi thanas was for some time reduced to a state of panic, and neither colliery managers nor chaukidars furnished complete information. When the epidemic started work was being carried on at high pressure all through the field, owing to the exceptionally high prices obtainable for all qualities of coal; the disease spread rapidly through the field and panic-stricken coolies hurrying away from the infected collieries spread the disease into all parts of the district. In March the epidemic started and in May it reached its height; in June there was some abatement and it died rapidly away shortly after the rains broke. The primary causes were undoubtedly the absence of proper sanitary arrangements for the large population collected together in the comparatively small area covered by the coal-field, the exceptionally dry cold weather following on an early cessation of the rains, and the consequent drying up or pollution of the ordinary sources of water-supply.

It is not very easy to specify any definite part of the year as the cholera season, but taking the statistics for a number of years the months March to July would appear to be those in which a serious outbreak is most usual, though occasionally, as in 1907, the disease starts as early as January and reaches its height in

February. Generally speaking, the last four months of the year are comparatively free.

It is worthy of note that during the outbreak of April-June 1908 a large number of persons both European and Indian in and near Jharia submitted to inoculation at the hands of Professor Haffkine, with excellent results.

Small-pox.

Small-pox appears every year but is rarely either epidemic or widespread; it was only in 1902 that the death-rate rose over 1 per mille, the incidence being greatest in the months of April and May. For the five subsequent years the average incidence was somewhat less than 2 per 10,000, as compared with rather more than 3 per 10,000 for the preceding decennial period.

Bowel complaints.

Dysentery, diarrhœa and other forms of bowel complaints are credited with barely two deaths per 10,000, but as has already been pointed out the general tendency is to report all deaths, where the disease is accompanied by fever, as due to "fevers." No great reliance can therefore be placed on these figures, though it may perhaps be asserted with some degree of confidence that the climate is not, as a rule, provocative of this class of diseases, and in respect thereof the district is among the healthiest in the Province.

Plague.

From the ravages of plague the district has been singularly immune; the disease indeed appeared at Jharia in the cold weather of 1906-07 and for some months there were sporadic cases, but the prompt measures taken by the Local Committee which included the burning down of part of the Jharia bazar where the disease had started, and a vigorous campaign of rat-killing throughout the adjoining colliery area apparently prevented the disease from getting a hold. The number of reported deaths was only nine and there has been no recrudescence in the area then affected. In the following year there were two isolated cases, both imported from Mirzapur at Balarāmpur, and in 1909 one death occurred at Purulia, the victim having brought the disease from Calcutta.

Infirmities.

The infirmities of blindness and leprosy are very common, the number of blind persons and lepers per 10,000 head of population being in 1901 something over 35 and 30 respectively, as contrasted with only 18 and 9½, the figures for the province as a whole. No special reasons are assignable for these high figures, though in the case of leprosy the number is swelled by the inclusion of a good many from the neighbouring districts of Burdwan, Bānkura and Bīrbhum, which with Mānbhum appears to be a special focus of this disease, brought together in the local asylum, of which an account will be found at the end of that chapter. The majority of the persons afflicted belong to the lowest classes.

Vaccination. Vaccination is compulsory only in Municipal areas, but on the whole it does not appear to be regarded with any great disfavour by the people generally; the ordinary attitude is one of more or less passive indifference, and it is only occasionally and in limited areas that active objection is taken. In 1908-09 57,593 persons or 44 per mille of the population were successfully vaccinated, and the average annual number in the previous five years was 47,984 representing 36 per mille. The district was formerly the great centre of inoculation for the whole of the Chota Nāgpur Division, and though the practice has now practically died out the following account taken from the Report on the subject by the Inspector-General of Civil Hospitals in 1869-70 and reproduced in Hunter's Statistical Account may be of interest. "Most of the inoculators (called *tikaits*, from *tika*, a mark) were Brāhmans, and the District was divided between them, so that each inoculator had a circle within which he had an exclusive right, recognized both by other *tikaits* and by the inhabitants, to carry on his profession. Besides this they practised in the neighbouring districts of Lohardaga and Singhbhum, and to a limited extent in Hazāribagh As a rule each family of *tikaits* held some land which had been granted to them by zamindars for their services, but depended chiefly on inoculation for a living. The average fee charged was four annas for a male child, and two annas for a female; but the expenses for the religious ceremonies attending the event, and the present usually made to the inoculator on the thirteenth day after the operation, made the outlay so great that it was regarded as an expense to be incurred only once in a lifetime. The instrument used was a small iron screw about two inches long, sharp at one end to prick the skin, and flattened at the other to apply the small-pox matter, which was carried in the shell of a fresh-water mussel."

SANITATION. In 1873 the Sanitary Commissioner reported that "in the district at large, sanitation, even in the most ordinary sense of the word, is not attended to, except in the larger villages, such as Raghunāthpur, Jhalda, Mânbazar, etc. Where municipalities exist, conservancy is looked after, and a certain amount of care and cleanliness is observed. European and native ideas differ widely in matters of household sanitation. The dwellings of the natives are constructed without the least regard to light and ventilation; and generally, heaps of bones, broken pottery, animal ordure, straw saturated with offensive liquids, dried and rotten leaves, etc., are found around them." To a great extent this description remains true to the facts, though it is perhaps unfair to describe the smaller villages as generally insanitary, the natural conditions ordinarily obviating the necessity of any elaborate sanitary arrangements, and the habits, at any rate, of the superior aboriginal races, *e.g.*, the Sonthals, being for the most part rather more cleanly than might be inferred from this description. Of the larger villages with few exceptions, the description is much nearer to the facts, and outside the municipal towns and the Jharia coal field, to which reference will be made later, there is an entire absence of any methodical sanitary arrangements.

In Purulia.

Purulia was described in the same report as having generally excellent sanitary arrangements; its population was then under 6,000, which had by 1901 grown to over 17,000. Even now, however, few parts of the town are congested, and the natural drainage (most of the main roads have pukka roadside drains) is sufficient to keep the town fairly clean, though the eventual necessity for a regular drainage system is realised, and a scheme is now under preparation. The conservancy arrangements, usual in municipal areas, are in existence and, besides the road-cleaning and scavenging establishment, a large body of sweepers are maintained for private latrines. There are numerous good wells in the town, the municipality maintaining some nine, and the Sahibbandh, elsewhere referred to, is a practically never-failing source of good drinking water, special precautions being taken to prevent its pollution by surface drainage and when necessary, by persons or cattle bathing therein. Besides the Sahibbāndh there are a few other fairly clean tanks; the chief obstacle, however, to good sanitation is the large number of smaller tanks, a few of them public property but the bulk private, which are to be found in all parts of the town and which are more or less permanently polluted by surface drainage, sullage or other sources of pollution. The task of filling up or draining many of these is one which has to be faced sooner or later, but in its present financial condition the municipality can do but little.

In the villages.

Beyond short lengths of roadside drains, the provision of a few municipal wells, and of a small conservancy and scavenging staff neither the Jhalda nor Raghunāthpur Municipalities have been in a position to provide very much in the way of improved sanitation; strictly speaking, however, they are not towns but merely large villages, and as such conditions are certainly very much better than in some of the rural villages, with rather smaller population, but almost as important as centres of trade. In these, as for example Balarāmpur, Chāndil, Mānbazar, Chās and

Cheliāma all in the Sadar subdivision, of which all but the last named are centres of the lac industry, the sanitary condition leaves much to be desired; attempts are made from time to time with varying success to regulate the nuisance arising from the waste-water from the lac factories, and occasionally the local shop-keepers combine for a time to employ one or more sweepers to keep the main street comparatively clean; generally speaking, however, no special attention is paid to sanitation beyond the provision of an occasional well by some public-spirited shop-keeper or merchant or by the District Board. The latter body, it may be noticed, has now on its books 21 wells besides 8 tanks, and provision is annually made for some 8 or 10 new wells in different parts of the district. Dhānbāid which has recently become the head-quarters of the subdivision and shows signs of rapidly growing into a considerable town, has taken early steps to regulate itself; a strong local committee has been formed with the Subdivisional Officer as President and about one thousand rupees, raised by subscription locally, is spent annually on a conservancy staff. A similar committee is mooted for Katras, and it is proposed eventually to convert these into regular Union Committees.

In the coal fields.

Sanitation in the coal field area is a problem which has given infinite trouble during the past five years, and is far from being solved yet. Prior to 1906 when plague broke out at Jharia and there was a general scare, practically nothing was done; coolies were indifferently housed, or left to arrange for themselves, here and there only attempts were made to provide comparatively pure drinking water, and conservancy arrangements were conspicuous by their absence. The outbreak of plague resulted in the formation of a special Sanitary Committee consisting of representatives of several of the leading firms interested and of the local zamindar, the Civil Surgeon of the district, the local Medical Officer of the Indian Mining Association and the Subdivisional Officer with the Deputy Commissioner as President. The suppression of the plague outbreak and the warding off of any possible recurrence were the primary objects of this Committee and with the active co-operation of the Raja's Manager a good deal was done to clean out the Augean stable existing in the shape of the crowded and filthy Jharia bazar. A staff of Inspectors with gangs of coolies was organised, which, besides directing the rat-catching operations, were to take steps to clean up specially insanitary *bastis* or collections of coolies' huts. At the same time most of the larger collieries employed a more adequate staff of sweepers for the conservancy of their own particular collieries, and a more enlightened policy began to be adopted in the matter of provision of regular cooly lines and the supply of drinking water. With the departure of plague and in the absence of any law or recognised rules which could be enforced, the energies of the Committee and their staff very soon ceased to have any great effect, and on the smaller collieries and in the villages adjoining or in the midst of the colliery area, where the authority of the Committee, or of individual colliery managers of more enlightened views or greater public spirit, did not extend, conditions rapidly reverted to what they had formerly been. The recurring cholera epidemics of 1906 and 1907 stimulated to renewed efforts on the part of a few managers, and in the matter of cooly lines the good example set was of considerable effect; little attention was, however, paid to the water-supply question outside a very limited circle, and the result was the disastrous epidemic of 1908, which, besides causing enormous mortality, practically brought the working of the mines to a standstill for nearly three months at a time when every extra ton of coal raised meant a record profit. The immediate result was the expenditure of very large sums by most of the leading concerns on more or less elaborate arrangements for improving the water-supply of their respective collieries; two or three had already, before the outbreak, installed Jewel filter systems, and these proving generally satisfactory, were quickly introduced elsewhere, in some cases on a very large scale. The housing of coolies also received renewed attention, the medical and conservancy staff on many collieries was strengthened, and here and there some effort was made to clean out and reserve tanks, and to provide surface drainage in the cooly lines. It was generally felt, however, that the solution of the problem did not and could not lie with individual colliery managers, or in individual schemes; insanitary conditions in adjoining villages and in the numerous smaller collieries, where the efforts towards improved sanitation were neither vigorous nor sustained, remained a constant source of danger to the better managed properties in their neighbourhood; moreover in many cases private arrangements for proper water-supply by means of Jewel filters or otherwise were rendered difficult by the absence of a sufficient supply of pit or other water which might be filtered and rendered potable. A general scheme to supply the whole coal field was mooted, and was gone into with some care; *primâ facie* such a scheme is desirable and ultimately necessary but the problems involved, both engineering and financial, are of considerable complication, and up to date no scheme has been worked out in sufficient detail to enable a proper examination of the possibilities and difficulties to be made.

Necessity for legislation.

Another lesson brought home by the 1908 epidemic following as it did on serious, though less severe, outbreaks in the two preceding years was the necessity for legislation enabling the enforcement of ordinary sanitary and conservancy rules. The interests engaged in the coal industry are many, and to some extent conflicting, and till recently any general public spirit over-riding individual and temporary interests has been conspicuous by its absence. Concerted action was to a certain extent possible where collieries belonged to the Indian Mining Association, but there were and are many which do not. Moreover the number of small concerns with very small capital, and of others whose working capital is inadequate owing to the inflated sums paid to promoters when the mines were first opened or taken over from their previous owners during the height of the boom, is considerable; any heavy expenditure on water supply and sanitation, the return from which is only at the best prospective, can hardly be expected, and the result is that danger spots remain alongside and in the midst of areas where the most enlightened and wealthier collieries have sunk large sums in improving conditions A similar state of things exists in regard to many of the villages in the neighbourhood of collieries, originally small agricultural villages, now largely crowded out by extra population connected with the mines; here too power to compel the reservation of tanks and wells, to control the manner and place of disposal of the dead, to clear out congested areas and to enforce comparative cleanliness within the village site is an urgent desideratum.

Various proposals have been made from time to time and have been rejected as unsuitable or impossible. The proposal to form the whole area into a municipality was one of the earliest, but the Act was obviously unsuitable for an area so large; the limitations of the Epidemic Diseases Act rendered a second proposal to promulgate rules under that Act of little value, as such rules could only have been enforced for the short period of six months. Great things were expected of the new provisions in regard to Union Committees embodied in the Local Self-Government Amendment Act of 1908 and it was hoped that it would be possible to form two or three Union Committees under the Act with sufficient powers to enforce the sanitary rules already propounded. Unfortunately it proved that the provisions of the Act in regard to finance put such Committees out of the question, and this proposal like the others had to be abandoned. The solution of the problem has still to be found; it is generally thought to lie in some amendment of the Indian Mines Act, extending the definition of "mine" to include not merely the actual workings as at present but also the colliery premises, including the cooly lines generally, and in order to meet the difficulty in regard to outside villages, the addition of a suitable definition of a mining settlement, which should include them. These changes with due provisions for suitable committees with powers to enforce rules and a staff to inspect and report on sanitary conditions will, it is hoped and anticipated, meet a great part, at any rate, of the present difficulties of the situation. A general water-supply scheme to supply pure water pumped from the bed of the Dāmodar river, throughout the coal field has so far failed to materialise, and in the present depressed condition of the coal industry it is hardly likely that any such scheme, even though feasible from an engineering point of view, could be financed. Meantime the Sanitation Committee already referred continues to exist and maintains a small staff whose main business it is to give early information of any outbreak of epidemic disease, and to form a nucleus for the larger staff which would be necessary to deal with any really serious outbreak. The provision of improved cooly lines continues, experience showing that the labour force now looks upon weather-proof huts or "dhowras," as they are locally called, as more or less essential; when not provided the coolies will not stay. Some attempt is also made in most of the larger collieries to provide comparatively pure drinking water, but even now there is much to be desired in this respect, and instances are not infrequent where a couple of wells, without any arrangement for distribution through the lines or workings, are the only provision for a labour force of upwards of a thousand. Tanks and old quarries filled with water must in such cases be used and also the pit water, and all these are more often than not polluted, so that the possibility of a recurrence of serious outbreaks of cholera is a constant one. Nowhere as yet in the coal field is latrine accommodation provided and the resulting evils must necessarily grow more acute as the area becomes more and more congested. Altogether though in the last few years there has been a considerable improvement, the absence of method and system in matters of sanitation in the Jharia coal field presents a far from pleasant picture, and considerations of common humanity as well as the interests of the industry call for early and concerted action.

Medical Institutions.

There are eight public dispensaries situated at Purūlia, Jhalda, Raghunāthpur, Chās and Baiābazar in the Sadar subdivision and at Dhânbâid, Topchânchi and Gobindpur in the Dhânbâid subdivision. Private dispensaries supervised by the Civil Surgeon, are also maintained at Jharia and Pândra by the proprietors of those estates. The zamindar of Nâwagarh also keeps up a small private dispensary and the majority of the larger collieries have their own arrangements for the medical relief of their labour force. At Pokhuria medical relief is provided in ordinary cases by Revd. Dr. Campbell of the United Free Church of Scotland Mission to the Sonthals, and occasional visits are paid by one of the medical missionaries from other stations in the Sonthal Parganas or Monghyr.

In-patients are received at (1) the Purūlia dispensary which has 26 beds for men and 8 for women; (2) the Jhalda dispensary with 2 beds for men and 2 for women, (3) the Barâbazar dispensary with 4 beds; (4) the Jharia dispensary with 5 beds; (5) the Purūlia infectious diseases' hospital with 8 beds for men and 8 for women, and the new dispensary at Dhanbaid, when complete, will have accommodation for 6 male and 4 female in-patients.

The oldest dispensaries are those at Purūlia, established in August 1866, and at Pândra, established by the liberality of Râni Hingan Kumari in December 1872. The most important of the medical institutions is at present the dispensary at Purūlia; it is maintained by the municipality with the help of a contribution from the District Board, private subscriptions, and a small endowment fund, devoted to the maintenance of a trained *Dhai*. From time to time improvements have been made from funds obtained from various private donors, and a new operation ward is shortly to be constructed and other improvements made, the bulk of the money required having been subscribed by the two leading zamindars of the district, Jyoti Lal Prosad Singh Deo of Kâshipur and Râja Durga Prosad Singh of Jharia.

The new dispensary at Dhanbaid promises, when complete, to be a model institution; besides the main dispensary building there will be separate wards for males and females providing accommodation for 16 patients in all, an infectious diseases' ward with 2 beds, a moribund ward with 4 beds, besides a fully equipped operation room built on the most approved principles, and suitable quarters for the dispensary staff. The dispensary is managed by the District Board which contributes Rs. 500 annually towards its upkeep; there is a subscription list amounting to some Rs. 2,675 per annum, a large part of which is contributed by the various colliery companies, and Government, besides meeting the charges on account of the Assistant Surgeon's salary and allowances, contributes Rs. 545 annually. The dispensary has been open as an outdoor dispensary since July 1908, and the remaining buildings are now practically complete.

Dispensaries are maintained by the East Indian Railway Company at Dhanbaid and by the Bengal-Nāgpur Railway at Adra, at both of which places there are resident medical officers.

Indigenous system of medicine.

The European system of medicine and surgery has steadily gained popularity, and at Purūlia, Dhānbāid, Jharia and a few places within the district there are medical practitioners with Calcutta or other qualifications, whose practice is considerable and is for the most part conducted on European lines. Outside, however, the immediate radius of the dispensaries European drugs are not commonly used, and the majority of the people consult Indian doctors, either Muhammadan Hakims or the Vaidyas who practise the Hindu system of medicine. In the remoter areas the village *ojha* or the barber is consulted, and the treatment consists in many cases of incantations, charms or the performance of *pujas* varied with the use of a few comparatively simple herbal remedies, the knowledge of which in particular diseases has been handed down from father to son. More or less complete starvation and abstinence from drink is ordinarily prescribed in fever cases: in other diseases the remedies range from comparatively harmless and occasionally suitable drugs such as opium, camphor, nutmeg, myrabolam, aloes, lime-juice, salt, vinegar, assafœtidā to various nauseating compounds including such materials as animal urine.

Leper Asylum.

The Leper Asylum at Purūlia was started on a small scale in 1886-87 by the Rev. Hemrich Uffmann of the German Evangelistic Mission in connection with the Mission to Lepers in India and the East. It was removed to its present site, about two miles west of the public offices and entirely separated from the town and its outskirts by a broad strip of cultivation, some four years later, and in the years succeeding has grown into a small town of itself, neatly laid out in a large *sāl* plantation with well-built brick houses accommodating each some 12 persons, each house being 50 feet from its neighbour on either side. Down the centre runs a wall which separates the male wards from the female, and along it at intervals are the offices, the shop, the hospital and in a central position the church. For doubtful cases there are separate observation wards, and half a mile or more away and nearer the town is a large building and compound forming a home for the untainted children of the lepers. Both here and in the Asylum itself are schools, including for untainted children a Technical School where carpentry, mason-work and other useful crafts are taught. In the main Asylum there are now 22 wards for men and 18 for women, of which all save 3 (two male and one female, built at Government expense) have been provided by the supporters of the Mission and other friends.

The average population is from 600 to 700, the actual number in May 1910 being 629, inclusive of 41 cases under observation and 50 children in the "Untainted Children's Home." The popularity of the Asylum is such that the majority of cases find their way there willingly, and the number of lepers sent there by the Magistrate under the Act is, as a rule, very small. A large majority of the inmates are, however, such as could legally be sent there, and in consideration of this fact and the useful work done by the Asylum, it receives an annual grant of Rs. 12,000 from Government.

The Asylum is now the largest of its kind in India; as already stated it is situated pleasantly and in a healthy situation. Numerous wells have been sunk, and cisterns and bathing platforms provided and both houses and compound are kept scrupulously clean by the lepers themselves, each separate house having one of it inmates responsible as house-master or mistress as the case may be. Those who are able to do so are encouraged to keep up their own small patches of garden, and recently advantage has been taken of the Land Improvement Loans| Act to build a tank and bring some of the extensive waste land beyond the Asylum under cultivation.

One of the features of the place is the shop where small luxuries can be purchased, each adult male getting a cash allowance of 5¾ annas and each adult female 4 annas per week besides a daily allowance of uncooked rice; the making of their small purchases and the cooking of their own food add undoubtedly to the pleasure of their lives and to the popularity of the Asylum, and make cases of evasion rare, though the opportunity is always present, the Asylum being open on every side and in no sense of the word a prison.

From the outset the working of the Asylum has been in the hands of the German Evangelical Mission, and to the Rev. H. Uffmann, who initiated the work, and the late Rev. F. Hahn and the Rev. P. Wagner (now in charge) especial credit is due for its thoroughly efficient organisation and management.

CHAPTER V.

AGRICULTURE.

GENERAL CONDITIONS.

THE surface of the district consists generally of a succession of rolling uplands with intervening hollows, along which the drainage runs off to join the larger streams The soil is naturally an infertile laterite of, as a rule, no great depth, and the general tendency is towards continual detrition, the process being continued till the underlying rock or heavier gravel is exposed, wherever the higher lands are denuded of vegetation and nothing done to bring them under cultivation, before the disappearance of such vegetable loam as had formed there in the days when the forest or vegetation remained. Similarly, the more level spaces between the ridges and undulations require constant protection, if they are to retain the soil that has been washed down from the higher slopes, as every heavy shower tends to wash the soil down, first into the smaller streams and finally into the larger rivers The first essential, therefore, from the cultivator's point of view, is to break up this constant surface drainage and stop the consequent detrition, and the result is to be seen at the present day in the conversion of the slopes and hollows, wherever practicable, into terraces of different levels, these again being cut up into smaller patches each with its protecting embankment, varying in height from a few inches to several feet. The rainfall is thus retained on each particular terrace and field, and cultivation of a wet rice-crop made possible. The power of retaining moisture varies, largely, of course, with the nature and depth of the soil, and percolation from one terrace to another is more or less slow or rapid ; the lower, however, the level, the more the field benefits by the moisture percolating from those above it, and except where the nature of the soil and the absence of proper drainage is such that they become water-logged, the lowest levels ordinarily furnish the best and most secure rice lands.

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A system of cultivation, such as is described above, is suitable mainly for rice, and rice is the main crop of the district. Land on the ridges, where there is a sufficiency of soil, is cultivated without the preliminary process of levelling with a crop of early (*gora*) rice sown broadcast, or with *kodo*, or one of the pulses *urid* and *mung*, known locally as *biri*, in the early rains, May to October, and with various oil-seeds in the cold season. High lands near the village sites, which are within reach of such manure as is available, are cultivated in the autumn with maize, *kodo* and *biri*, and in the spring such lands may also yield a crop as oil-seeds, or occasionally of wheat or barley.

The extent of cultivation varies with the predominance of particular characteristics. South of the Dāmodar in the northern half of the Sadar sub-division, an area of some 1,500 square miles, the undulation of the country is comparatively slight, and except along the eastern and western borders where much scrub jungle still remains, cultivation is fairly close, and the eye is met, as one tops each ridge, with the view of a large expanse of terraced rice fields, dotted with numerous small tanks and here and there clumps of trees, marking the village sites. In places, more especially in thana Raghunāthpur and the eastern portion of thana Chās, the ridges are comparatively low and the intervening hollows so extensive that the terracing is barely noticeable except to a close observer, and the impression obtained is rather that of a stretch of ordinary Bihar or Eastern Bengal rice fields; such favoured tracts are, however, rare.

South of Purūlia itself and a line drawn east and west, practically coinciding with the Bânkura and Ranchi roads, conditions are less favourable, bare uncultivated stretches of high land are more in evidence, the country is more broken up as it falls rapidly away to the Kāsai river. Towards the west the rugged Ajodhya range rises abruptly from the plain south of, and at no great distance from, the Kāsai. To the east the country is better clothed with vegetation, but scrub jungle and bare high lands are more in evidence than cultivation. South of this again is an area of fairly close cultivation stretching towards the hilly range which, with the Subarnarekha below it on the south, divides the district from Singhbhum. As the hills are approached cultivation becomes scattered, giving way as one advances further to stretches of scrub jungle and when the foot hills are reached to traces of the great forests which once clothed this range.

INFLUENCE OF RAINFALL.

The second main condition on which the nature and extent of the agriculture depend is the climate and, more especially, the rainfall. As will be seen from the account just given of the physical conditions which prevail in the district of Mānbhum, rainfall is necessarily a matter of prime importance. Without adequate rain in due season, both preparation of the soil and sowing of the crop is impossible, the soil itself not being naturally one that can retain moisture for any considerable length of time. The normal annual rainfall of the district is 53 inches of which nearly 44 represent the ordinary fall in the months of June, July, August and September; 3 inches may be expected in October and November, less than 1½ inches in the three succeeding months, and somewhat under 5 inches in the months of March, April and May. The ideal distribution for the cultivator who relies mainly on his winter rice crop, is a sufficiency of showers in early May to enable him to get his fields dug over and ploughed. He then requires fairly heavy rain at the end of May in order to prepare his seed beds, sow his seedlings and have sufficient moisture to keep the young plants green till the regular rains commence. This should be between the 15th and 20th of June, and to be really useful the fall during the latter half of June should measure some 8 to 10 inches. While he is going on with the preparation of his fields, which includes several ploughings, the repairing and strengthening of the *ails* and embankments and other preliminary preparations, his seedlings are growing rapidly and by the second week of July he should be able to begin transplantation, and with fairly regular but not too heavy rain throughout July and in the earlier part of August, he should complete this in fields of all levels by the middle of that month. Thereafter, all that is required is sufficiently heavy rain at intervals to keep the young crop almost continuously standing in a few inches of water. About the second week of September, it is usual to run off the surface water with the idea of encouraging the formation of the grain but in doing so the cultivator incurs a considerable risk and this practice makes a heavy fall of rain at the end of September an absolute necessity. Given this, however, and some 3 or 4 inches in the first fortnight of October his crop, even if no further rain is received, should be a bumper one.

It will thus be seen that it is not merely the quantity of rainfall which is important, but also the timeliness or otherwise of the different falls. If, for instance, the May rains fail, the preparation of the fields, the sowing of the seeds in the seed beds and their subsequent transplantation are all delayed, and the crop ultimately suffers in a greater or less degree, even though the rains in the latter months are timely and adequate. Again, when after suitable rains in May the June rains are delayed, the cultivator will have his time cut out to keep his seedlings alive; in extreme cases he may have to begin over again, when the rains do come, by sowing fresh seed at the time when he ought to be transplanting, with the result that by the time the fields are planted out the best part of the rainy season will have gone by and his chances of getting anything more than a poor crop will be very small. Again, when all conditions have been favourable down to the middle of September, the absence of rain during the succeeding three weeks or a month will mean probably the entire loss of his crop on the higher level fields, and at the most a 50 per cent. crop on those on the lowest level, unless by irrigation he is able to make up for the deficiency in the necessary moisture. For the *bhādoi* crops an early cessation of the rains does not so much matter, but the earlier rains must be ample. For Indian corn, though ample rainfall is necessary, ample sunshine is almost equally important as without it the grain will neither fill out nor ripen. For the *rabi* crops the September rains are all important, as without them the fields will not contain sufficient moisture to germinate the seed, and to ensure a full crop periodical showers from December to February are also necessary.

Irrigation.

The dependence of the crop on rainfall is thus such as to make it very necessary that the cultivator should be prepared to supplement deficient rainfall by irrigation Unfortunately, the nature of the country lends itself to one system only, viz, that of irrigation from *ahars* and *bāndhs* themselves dependent for their supply of water on the rainfall. In other districts, as for example in Gaya, it is possible to feed the *ahars* by channels or *pains* taking off from the different streams which depend for their water not on local rainfall but on the rainfall of the hilly regions where they have their source In this district all the larger rivers, and most of the smaller streams, run a very rapid course along beds which are usually very much below the general level of the surrounding country and, in order to utilize their water for irrigation purposes, it would ordinarily be necessary to construct channels of great length and through very difficult country at an expense which would be prohibitive.

The *bāndhs* of this district of which there are, as a rule, several in every cultivated village, are simply embankments thrown across a favourable dip in the general level of the ground. In some cases the embankment is a comparatively high one across a deep valley, but ordinarily any existing natural depression is made use of by raising a low bank on one or more of its sides. In a few cases as much as 100 acres of land may be irrigable from such a *bāndh*, but in the vast majority the area irrigated is from 5 to 10 acres only. Such *bāndhs* are constructed practically wherever it is possible to catch a certain amount of surface drainage and at the same time to terrace a few rice fields below them. The irrigation is effected ordinarily by percolation; only in exceptional cases is the *bāndh* cut or the water drawn off by a pipe or other outlet, as for instance, when water is required to preserve the seedlings or, towards the end of the season, to make up for the deficiency of the rainfall. For cold weather crops such *bāndhs* are ordinarily useless, as in a dry year the majority retain little water after December. When land is first brought under cultivation, the cultivator naturally tackles first the land in the lowest part of a dip and the *bāndh* constructed is usually some way down the slope and, consequently, gets a large amount of surface drainage and is so much the more useful for irrigation purposes. As cultivation extends, the lower *bāndhs* are themselves converted into rice fields except where they have been excavated to any great depth, and the new *bāndhs* constructed higher up get proportionately less water and at the same time have to serve a larger area. The general result, in areas where practically the whole of the easily available land has already been brought under cultivation, and this applies to a large part of the district, is that the *bāndhs* are of comparatively little value as a safeguard against failure of the crops and in a year of very deficient rainfall, being themselves dependent on the rainfall for their water, they can hardly be classed even as protective works

WELLS.

Irrigation from wells is practically unknown; only masonry wells, sunk to considerable depth, would be suitable in a soil composed so largely of gravel and disintegrated rock, and construction of such wells, the cost of which can never be accurately estimated in advance owing to the possibility of meeting hard rock, is only within reach of the exceptionally prosperous cultivator ; they are rarely met with therefore outside the village site. Kutcha wells are occasionally sunk a few feet in the beds of *bāndhs*, or in low level rice fields, but this is done ordinarily in order to supply drinking water for men and cattle, when other sources have failed, and not for irrigation.

EXTENSION OF IRRIGATION.

Beyond multiplying the number of *bāndhs* and enlarging and deepening existing bāndhs, extension of irrigation is hardly possible except at prohibitive cost. Various schemes for irrigation dams and channels were considered in connection with the enquiries made by the Irrigation Commission of 1901-03, and a few of these were examined in greater detail in 1907 by an Executive Engineer specially deputed for the purpose.

Of these, only one project was of any size or importance, viz., the proposal to throw a dam across the Sāldaha Jhor some five miles south of Jhalda near the village Lagām. Here the stream passes between two hills in a valley about a mile wide, and the Executive Engineer considered that at a cost of about Rs. 60,000 it would be possible to form a reservoir of sufficient size to irrigate an area of some two to three thousand acres in some half dozen villages. No detailed plans and estimates have yet been prepared and it is, perhaps, doubtful whether the scheme is really at all practicable and it is certainly doubtful whether the return in the shape of additional rents, if the local Zemindar undertook the cost of construction, would anything like recoup him or, should Government construct the reservoir, whether a water-rate, such as the tenants could pay, would give an adequate return on the outlay. The stream being a comparatively small hill stream with only a small drainage area, it seems unlikely that sufficient water would be stored in the years in which water is most necessary, *i.e.*, the years in which the rains absolutely fail.

The District Famine Programme provides for the construction or improvement of *bāndhs* in a large number of villages. Such *bāndhs* make cultivation possible, and they reduce the chances of entire failure of the crop in years of badly distributed rainfall, though, as already explained, in a year of deficient rainfall they are liable to fail as sources of irrigation just when they are most needed. Still a degree of protection is better than none at all, and, in the absence of any workable scheme to ensure complete protection, it seems desirable that the construction and improvement of *bāndhs* should be encouraged in every possible way.

SOILS. The prevailing characteristic of the soil is hard ferruginous gravel with a thin overspread layer of vegetable mould, where protected by jungle growth or otherwise from detrition. The system of cultivation as well as the rapid denudation of the jungle, prevents any great addition being made to the alluvium, and for its phosphates and nitrates the cultivated area has to depend mainly either on rotation of crops which is barely practised at all except on the high lands, or on such manure as the cattle which graze unrestrained after the rice harvest provide, or the mud dug out periodically from the dried up *bāndhs* and tanks. Except on the high lands adjoining the homesteads and on lands selected for sugarcane, regular manuring with cattle dung is rarely gone in for, and the increasing difficulty of getting wood tends to make the cultivator trench more and more on the available supply of cattle dung as a substitute for firewood.

Scientific classification. Mr. Mukherji in his note on the soils of this district classifies them as follows:—

I. Clay or *chita*—

(a) *Gobra chita* is of a blackish colour, very hard when dry and impossible to plough till softened by much rain. It is retentive of moisture. Rice, oilseeds, gram and cotton are grown on this land.

(b) *Dudhi chita* is of white or reddish colour. It is an impermeable clay mixed with limestone nodules. It is sticky when wet but very hard when dry. Grows no crops.

(c) *Dhaba chita* or *karna* is also very similar to the above in physical character and agricultural value. It is a source of lime.

II. Loamy soil—

(a) *Dorasa* is found near the hills and on the tops of ridges.

(b) *Pali* is soil formed by rain washings from higher situations and consists of detritus of decomposed rocks and vegetable matter. When the proportion of clay predominates it is called *pali bāli* (clay loam), and when on the other hand the proportion of sand predominates it is called *bāli pali*. The silt deposited by the Subarnarekha river on its banks, grows good crops of jute.

III. Sandy soil is known as *bāli*. It is commonly found in river beds and used for growing melons and other cucurbitaceous vegetables.

IV. A number of inferior soils unfit for cultivation are distinguished by their colour, etc., *e.g.*, *sāda māti* (white), *kāla māti* (black), *lal māti* (red), *kankar māti* (calcareous), or *pāthar māti* (gravelly), etc.

Popular classification.

This classification illustrates fairly clearly the general poverty of the soil, but for practical purposes the ordinary cultivator merely differentiates soils by position. Thus, there are the three classes of rice land, *bahal*, the lowest or the most benefited by percolation from a *bāndh* and most retentive of moisture, *kānāli*, somewhat higher, and less favourably situated in respect of moisture, and *baid*, the high terraces surrounding the *bahāl* or *kānāli*, and dependent entirely on the rainfall, much of which percolates rapidly on to the lower level fields.

High lands are known by the general term '*dānga*' or towards the west '*tānr*'; when cultivated they retain these names, or are called occasionally '*gorā*'; such lands give at the best a scanty outturn, and ordinarily they are cultivated only once in four or five years. The land immediately adjoining the homesteads is variously known as *bāstu*, *ud-bāstu* or *bāstu bāri*; it benefits by getting more of the available manure, and it is on this that the superior autumn and winter crops are grown.

Extension of cultivation. Some indication of the extent to which the area brought under cultivation has increased during the last 20 years is to be gathered from the latest Settlement Reports of the Tundi, Mātha and Kailāpal estates, to which reference has been made in an earlier chapter The first named is characteristic of the hilly area in the extreme north, Mātha of the country immediately south and west of the Bāghmundi range, and Kailāpal of the wilder portion of the country bordering on the Dalmā range in the extreme south. In Tundi in 1904 it was found that the area terraced for rice had increased in 20 years by nearly 80 per cent.; in Mātha by 15 per cent, and in Kailapal by 43 per cent. In the central and more advanced parts of the district the increase cannot have come up to even an average of these figures, but it would not be unsafe to estimate the extension of cultivation in the district as a whole during the last twenty-five years as approximating to 20 or 25 per cent. Cultivation is still extending in all parts of the district, though it is only in the areas still bordered by jungles that any rapid or considerable extension is now possible. The wasteful method known as "jhuming" is no longer very prevalent, but the destruction of jungle in order to bring under cultivation areas which are unlikely to remain culturable more than a few years at the outside, is common almost everywhere that any jungle remains. In the more closely cultivated areas extension is gradual, but in any favourable year new plots adjoining the existing cultivation are terraced and planted out with rice seedlings on the off-chance of getting some return, and here and there new *bāndhs* are excavated and new fields made below them, for the most part by tenants whose credit with the money-lender is considerable, or by the money-lender himself, such work involving a considerable outlay in cash, if the work is to be immediately productive.

PRINCIPAL CROPS. EXTENT OF CULTIVATIONS. According to the accepted Agricultural Statistics of the district, 59 per cent. of the district area was under cultivation in 1908-09, 7 per cent. consisted of current fallows and culturable waste, and the remaining 34 per cent. was not available for cultivation. This classification, which is not based on any detailed survey, can hardly be treated as more than an approximate one, and is probably only accurate, even approximately, so far as the percentage under cultivation goes. In Pargana Barābhum, which has recently been surveyed, and the area of which is rather less than one-sixth of the whole district, the figures prepared by the Survey Deparment show the percentage under cultivation as 48, current fallow and culturable waste 17½ per cent. and unculturable area 34½ per cent. Of the cultivated area included in the above figures, a considerable portion consists of high lands cropped only once in three or four years, and the average area under cultivation in any one year is barely 35 per cent.

In the other surveyed areas, which are of comparatively small extent and include a larger share of hill and jungle. the percentage under cultivation is 32 per cent. and 17 per cent., respectively, in the Kailapal and Mātha estates. Allowing for closer cultivation in the more level and open parts of the district, it would probably be safe to assume that not more than 45 to 50 per cent of the total area is under regular cultivation, and another 10 per cent. of high lands cultivated once in three years.

For statistical purposes the crops grown are divided into the three main divisions, *bhadoi*, *aghani* and *rabi*, according to the time of harvest; the *bhadoi*, the early or autumn crop reaped in the months of Bhādra, Aswin and Kartik, (September, October, November), includes *gora* and *bhadoi* rice, *marua*, *kodo*, maize and various less important millets; *aghani* is the winter crop including winter rice reaped in December (Aghan), sugarcane cut in January and early February, and certain varieties of oil-seeds; the *rabi* crop harvested in the spring includes such cold weather crops as gram, wheat, barley and various pulses and oil-seeds. The distribution of the normal acreage under these crops cannot, in the absence of detailed survey figures for the whole district, be given with any degree of accuracy but on the basis of the figures recently made available for Pargana Barābhum it may be accepted that approximately 50 per cent. of the cultivated area is under *bhādoi* crops, 46 per cent under *aghani* and 8 per cent. *rabi*, the twice cropped area being about 4 per cent. Even these figures must be accepted with caution, as those for *bhādoi* crops are swelled by the large area under rice which is reaped in November, and which is strictly speaking somewhere between a *bhādoi* and an *aghani* crop.

Rice is shown in the District Statistics as grown on an area of 1,428 square miles, and in Barābhum the area under this crop represents no less than 73 per cent. of the net cultivated area in any one year; it is, therefore, without question the most important crop. No distinction is made locally between *bhādoi* and *aghani* rice, and the only true bhādoi rice is that known as *gora*, sown broadcast on high lands in May or early June and reaped in August and September. This, except in the portion of the district bordering on the Rānchi district, is a small crop and represents at the outside a very small percentage of the whole. The figures on which the Rice.

estimate for *bhādoi* crops just given is based are swelled by the inclusion of all rice reaped earlier than December, that is to say, the whole of the rice crop grown on the *baid* lands, most of which in this district is transplanted and, except that it ripens rather earlier, differs in no respect from the winter rice reaped on the lower lands in December and January. Locally, the only distinctions drawn are between *gora* rice and other rice, the latter being sub-divided into *baidhān* (grown on *baid* lands) and *borhān* grown on *kanāli* or *bahāl* lands; the terms *bhādoi* and *aghani* as well as *aus* and *āman* are never used locally. Were the so-called *bhādoi* rice a variety sown broadcast and reaped not later than October, there would be some advantage in having the distinction drawn: as the facts are the differentiation is purely on paper and serves no really useful purpose: on the contrary it is probably misleading, because the impression obtained by any one familiar with conditions, *e.g.*, in Bihar where the *bhādoi* rice is a true *bhādoi* crop, from the assertion that the area under *bhādoi* rice in Mānbhum exceeds that under *aghani* rice would naturally be that, in a year in which the September rains failed after favourable conditions in previous months, at least half the rice crop was assured, which would, as a matter of fact, be far from justified by the facts. It should, therefore, be borne in mind that the bulk of Mānbhum *bhādoi* rice is, at any rate, a very late *bhādoi* crop, and likely to be adversely affected by conditions adverse to the later winter crop.

As already stated the area under *gora* rice is small, and, except towards the western border where the example of the Kol cultivators in Rānchi has perhaps had some effect, it is not a crop which the Mānbhum tenant ordinarily goes in for, preferring, when he does cultivate high lands at this season, to sow *kodo*, *gondli* or *urid*; a liberal estimate of the area cropped would be 5 per cent. of the whole area under rice, or about 70 square miles. The following are the chief varieties grown:—*charka*, *kala*, *sindurtupi* *alsanga*, *bheriya*, *prosād-bhog*, *rudni*, *kaya*, *nela*, *himri*, *kelesh*, *aus*, *hengri*, *bhasa*, *bahāli*, *kanhua*, and *luca*. In the north of the district where *gora dhan* is not grown at all its place is taken to a certain extent by the *Sāthi dhan*, so-called as ripening in 60 days, and remarkable on account of the fact that the grain ripens within the sheath and is, consequently, not exposed to the ravages of certain insect pests which attack other forms of early ripening rice.

The main rice crop grown on terraced lands and for the most part transplanted, may be taken as made up of 60 per cent. *bhādoi* or early ripening and 35 per cent. *āghani* or late ripening, the former being grown on an area of 858 square miles, and the latter on an area of 500 square miles. The former includes the whole of that grown on the highest or *baid* lands; that grown on the second class or *kānāli* lands is partly *bhādoi* and partly *aghani*, while the entire crop on the best lands (*bahāl*) is classed as *aghani*. The list and description given below of the chief varieties of rice grown on the different classes of land has been supplied by Rev. Dr Campbell, whose experience of agricultural conditions in the northern part of the district extends over some 35 years. The list only professes to be accurate for the Dhānbāid Subdivision, but may be taken as approximately accurate for the rest of the district also.

I. *Sāthi.*—This variety of *Dhan* is grown on high lands, generally the highest portion of *baid* lands, but not extensively A peculiarity of this variety is that the grain ripens within the sheath, and is therefore not exposed to the ravages of a certain fly pest, which renders early ripening *dhan* unproductive.

II. *High land Dhan locally known as Baid Dhan.*—Of this there are many varieties, the most important and most largely cultivated are :—

(1) *Badras.* Awnless, grain of a light brown colour, rice white. Ripens from 7th to 15th Kartik, and, in good soil and under good climatic conditions, yields from 50 to 60 fold. (2) *Jawae Laru.* Awnless, grain light straw coloured, rice white, grain medium size. (3) *Moifal.* Awnless, grain light coloured, narrow; rice white. Withstands drought well and is therefore cultivated in the higher *Baid* lands. (4) *Askuji.* Awnless, ripens from 7th to 15th Kartik; grain smallish and light coloured. (5) *Koya.* Fully awned, grain medium size, light coloured, ripens early. (6) *Dulngi.* Grain small, very dark coloured, rice white. If grown on sandy soils the grain is dark coloured, if on clayey soils it is light coloured. The grain is awnless.

III. *Dhan grown on second class lands, known locally as Kānāli.*—The most important varieties are :—

(1) *Kolom-Kāthi.* Awnless, grain long and narrow, light straw coloured, rice white. (2) *Ajan.* Awn on terminal grain of spike, grain large, light coloured, rice white. (3) *Pormai Sal.* Awned, grain very dark, often almost black, rice white. Emits a perfume when in process of being cooked. (4) *Kāli Kāsi Phul.* Awnless, grain dark coloured, often as if it had been smoked, rice white. Is also grown on *bahal* lands. (5) *Māloti.* Awnless,

grain small, darkish tinge, rice white. (6) *Kola Kandhi.* Awnless, grain small, light coloured, rice white, drought resisting. (7) *Bena Phul* Awnless grain medium size, light coloured, rice white. (8) *Kasi Phul* Awnless, grain small, straw coloured, rice white. (9) *Rai Mundi* Awned, grain small, light coloured, rice white

IV *Dhan grown on first class lands, known locally as bahāl.*—The most important are:—

(1) *Dhusri* Awnless grain dark coloured and small, rice, white Ripens early. (2) *Mānik Kolma* Awnless, grain darkish coloured and small, rice white (3) *Kumra Sal.* Awnless, grain light coloured short and thick, rice white (4) *Kumhar Sal.* Awnless, grain straw coloured, short and dumpy rice white. (5) *Qatal.* Awnless, grain straw coloured, medium size, rice white. (6) *Sal Mangan.* Sparsely awned, grain a dark straw colour, medium size, rice white (7) *Nani Kolma* Awnless, grain small, light coloured, rice white (8) *Jhulo* Awnless, grain light coloured and small, rice white. Ripens late 9) *Bāsmati.* Sparsely awned, grain very small and straw coloured, rice very fine and clean Emits a very pleasant perfume when being cooked (10) *Baj Panju* Has a few awns on each spike, grain very dark coloured, medium size, rice white, spikes of great length. This variety is grown in very moist situations (11) *Pormai Sal.* Awned, grain very dark coloured, often almost black, rice white Emits a pleasant perfume when being cooked (12) *Meru.* Awnless, grain short and thick very dark coloured, has the appearance of having been smoked, the husked rice has streaks of colour lengthwise. (13) *Hencha Range.* Awnless, grain bright brown colour and small, rice white. Ripens early. (14) *Kāmin Kajol.* Awnless, grain darkish coloured, small, rice white Ripens early. (15) *Sita Sal.* Awnless, grain light coloured, very small, rice very fine and white. (16) *Boro Kolma.* Upper grains in spike awned, grain darkish coloured and small, rice white. (17) *Bali Chur.* Awnless, grain tinged brown, very small, rice white. (18) *Chini Sankar.* Awnless, grain darkish coloured and very small, rice white. (19) *Chandon Sal.* Awnless, grain dark coloured, small and narrow, rice white (20) *Kari Bānki.* Awned, grain very dark coloured, rice white. Emits a pleasant perfume when being cooked. (21) *Ram Sal.* Awnless, grain light straw coloured, medium size, rice white. (22) *Narki Kolma.* Awnless, grain lightish coloured, rice when husked has a reddish tinge. Grain does not readily become detached from the straw. (23) *Chachi Mohul.* Awnless, grain deep brown colour, medium size, rice white. Ripens early.

Grain is readily detached from straw, and is therefore reaped before it is fully ripe. (24) *Dudhi Kolma.* Awnless, grain light coloured, rice white. (25) *Sāheb Sal* Awnless, grain light coloured, rice white. (26) *Ludhi Kolma.* Awned, grain light coloured, medium size, rice white. (27) *Sāgor Kolma.* Awnless, grain dark straw colour, long and narrow, rice white

Maize.

Next in importance to rice as a food crop is maize, occupying in Barābhum about 9 per cent. of the cultivated area, and in the district as a whole 172 square miles This crop is cultivated on an extensive scale in the extreme north and south of the district only, elsewhere it is confined to small patches near the homesteads, every Sonthal and, generally, every aboriginal cultivator growing a small quantity for home consumption only. As compared with Bihar it is noticeable that the crop is a poor one, very little trouble being taken with the preparation of the soil or its subsequent tillage and weeding in the early stages of the crop's growth.

Other crops.

Other autumn crops are *gondli*, *bājra*, *marua*, *kodo*, *mung* and *urid* grown for the most part on roughly prepared high lands, cropped as a rule not oftener than once in two or three years. Those with the winter crops, wheat and barley, gram, *rahar*, *khesari*, *kurthi*, *musuri* and various peas and beans, make up the miscellaneous food crops of the district and, according to the district statistics, are cultivated on 215 square miles, of which barely one quarter represents the area under the spring food crops. The unpopularity of such crops is due to several causes, one being the difficulty of arranging for the irrigation necessary for the superior crops, such as wheat and barley, and another the practice of allowing the village cattle to wander at will once the rice crop is reaped. If a second crop were raised on the moisture-retaining rice lands (a possibility which the local Agricultural Association is at present endeavouring to demonstrate), this practice would require modification unless the fields were fenced, which is out of the question on the ground of expense, except for very small areas. The conservatism of the local cultivator in this respect is not likely to be overcome until increasing pressure of population on the soil or higher rents compel him to make some endeavour to get more out of the land than the single, and at present in a normal year more than satisfying, rice crop

Of non-food crops oil-seeds, grown both as a winter and a spring crop, are the most important. Rape and mustard cover some 52 square miles, *til* or gingelly 16 square miles and others, of which the most common is *surguja*, some 10 square miles.

Sugar-cane is but sparsely cultivated, the area under this crop being barely 32 square miles; with few exceptions the quality of cane is inferior, and the outturn of *rab* or *gur* small. Cotton is a very small crop covering 16 square miles, and tobacco is grown in minute patches only, for purely local consumption, the total area under this crop in the whole district being estimated at less than 6 square miles.

Miscellaneous crops occupy a very small area. Potatoes and other vegetables are grown in small quantities only, in and near Purūlia and Jharia; the various varieties of sweet potatoes, *alu*, *suthni*, etc., are barely grown at all. Of productive mango gardens there are few, and fruits are represented almost entirely by the products of the jungles.

Outturn of crops.

The conditions under which crop-cutting experiments are ordinarily conducted, and the large amount of personal error which is possible, make it difficult to attach any great weight to the statistics compiled therefrom; this is particularly so in the case of rice which in a district like Manbhum is cultivated in small plots, each of which in the same area may differ more or less considerably in productivity by reason of its particular position in respect of the main source of moisture. From *bahāl* lands 30 maunds of paddy per acre would probably represent a fair average crop in a normal year, though outturns of 50 or even 60 maunds are by no means uncommon; for *kanāli* lands the average is from 20 to 25 maunds, though as much as 30 or 35 maunds are occasionally obtained. For *baid* lands it is almost impossible to state an average: 25 maunds would be an exceptional crop obtainable in a good year from specially favoured plots: 15 maunds is probably nearer the normal, and in many fields, cultivated more or less speculatively on the chance of getting a small return, 10 maunds would probably represent a fair outturn. For other crops the available statistics are of little value.

Improvements in cultivation.

It is perhaps doubtful whether the last 20 years have witnessed any marked improvements in methods of cultivation, and the attempts made of recent years by the local Agricultural Association to introduce good or new varieties of seed have, so far, borne little fruit. As elsewhere noticed there is not yet any great pressure of population on the soil, and in normal years the ordinary cultivator can garner in a rice crop more than sufficient for his needs without any great expenditure of effort, and, so long as this is the case, it is unlikely that the intensely conservative and not too energetic cultivator of this district will change his ways. The exertions of the Agricultural Association have so far been mainly directed to the introduction of a superior variety of Central Provinces *aus* paddy, and the encouragement of the sowing of a second crop of gram or *khesāri* on suitable rice lands. The former has proved almost uniformly a failure, owing to blight or other causes; the latter is being persisted in and in course of time may, by force of example and the demonstration of what is possible, have good results, but at present the outlook is not very hopeful.

Cattle.

The cattle are generally small and of poor quality, the main cause of which is no doubt the entire absence of good grazing, outside the hill areas, for more than half the year. An additional reason is the insufficient attention paid to reservation of bulls for breeding purposes, numbers of undersized, ill-fed and barely mature bulls being regularly found with every herd. A few superior bulls are available here and there, and in the north and west some inter-breeding with Hazāribagh stock is done, with good results. Buffaloes compare favourably on the whole with the cattle, and in many parts of the district they are extensively used both in carts and for ploughing. Sheep are of a very inferior kind, undersized for the most part and yielding a poor fleece. Horses are scarce, except in the stables of a few of the larger zemindars, and country ponies are not very numerous. The pig and the goat are the most flourishing of the domestic animals. There is a Veterinary Dispensary at Purūlia, in charge of a Veterinary Assistant, established in 1905, and also an Itinerant Veterinary Assistant with head-quarters at Dhanbaid. Three thousand one hundred and sixty-five animals were treated by these two officers during 1909-10, and 272 inoculated with rinderpest serum.

CHAPTER VI

NATURAL CALAMITIES

LIABILITY TO FAMINE

The extent to which Mānbhum as a whole is dependent on a single crop, i.e., the rice crop, and that again on the amount and the distribution of the rainfall, has been referred to in the preceding chapter, and it will not, therefore, be a matter of surprise to find that the district is classed as one liable, throughout its whole extent, to famine, though for reasons now to be explained it does not fortunately rank with those districts in which a failure of the crops involves 'intense' famine The primary reason for comparative immunity is the extent to which in hard times jungle products afford a source of food supply, which, though neither specially nutritious nor specially conducive to good health, yet suffices to keep the poorest classes of people alive for several weeks, if not months, at a time In Dr Campbell's account of the botany of the district, reproduced in earlier chapter, it is mentioned that there are no less than 90 species of plants which minister to the necessities of the people by providing food of a sort during scarcity or famine. Of these the most important is the mahua, both as a flower and as a fruit Even in ordinary years and in spite of the large demand for export for distillation and other purposes, the flowers of the mahua tree form a considerable part of the ordinary diet of the villagers, wherever the trees survive, during the months of April, May and June. Other important jungle products used by the poorest classes in ordinary years and resorted to by all classes in times of distress are the seeds of the *sal* tree, the fruit of the banyan and *pipal*, wild yams, the *bhela* (fruit of the Semecarpus anacardium), the *piar* (Buchanania latifolia), and the *bair* (Zizyphus jujuba), besides innumerable others whether seeds, fruits or roots. The value of such products of the jungles as a safeguard was, perhaps, hardly realised prior to the famine of 1897, and of course there is now a danger of over-estimation, as not only has the population increased but the jungles have very considerably decreased in area since then, but even now it is probably well within the truth to say that intense famine is improbable, if not impossible, in the wilder parts of the district.

Another most valuable jungle product, though not an edible one, is lac which provides a considerable cash income to very many of the smaller cultivators not only in the more outlying villages, where the wild *palas* and *kusum* are available for the culture of the lac-producing insect without any great capital expenditure, but also to those in the more settled areas, who are sufficiently enterprising to grow the common, *kul* or plum tree (Zizyphus jujuba) for the purpose. Nor is the benefit confined to the cultivator, a considerable amount of labour is required for the collection of the crop and its transport to the markets, and at the centres where manufacture is carried on, both skilled and unskilled labour command good rates of pay.

The opening out of the vast mineral resources of the district has, even since the last famine of 1897, made a very large difference in the condition of the labouring classes and their liability to be seriously affected by any shortage of the crops. According to the census of 1901, 4 per cent. of the whole population or 53.500 in all consisted of landless labourers and their dependents, and in the same year an average of 31,196 coolies found employment in the mines: by 1908 this number had increased to 72,000 and even this figure does not by any means represent the number of coolies for whom work is available, or who are actually employed at the seasons when there is least demand for agricultural labour. Moreover the demand for above and below ground labour in the mines themselves represents only a part of the additional demand for labour due to the activity of the coal trade; new colliery sidings are constantly being built, roads are being extended, the upkeep of existing lines of rail and road, the handling of trucks at the transfer and assembling stations, the unloading and distribution of the enormous requirements of the coal field in the shape of grain, oil, cloth, etc., besides machinery and other colliery stores, all call for a constantly necessary labour supply. It follows therefore that for the classes accustomed to manual labour, or ready, if driven by stress of scarcity, to take to it, there is now an ample field locally where the able-bodied can not only support themselves but also, the rates of wages being high, send home supplies to the weakly or incapable members of their families.

To these advantages is now added a fairly comprehensive railway and road system by means of which almost all parts of the district are within comparatively easy reach of outside sources of food supply, and the liability, which existed in 1874, of particular areas being left for days or weeks at a time with absolutely inadequate supplies or even no supplies at all in the local markets, is a thing of the past. Mânbazar in the east, the Bandwān outpost of Barābhum thana in the extreme south-east, portions of Bāghmundi and Chās thanas in the west and of Tundi and Topchānchi in the north are the least well protected areas in this respect, and further protection in the shape of improved communications is still desirable, but even in these areas no real danger of an absolute failure of food supplies exists, and as a set off against their disadvantages in this respect, they are for the most part the portions of the district in which supplementary sources of food supply in the shape of jungle products are available in greatest abundance

Further light on the subject of the present liability of the district to famine is to be found in the histories of earlier recorded famines and of the conditions of later years, when in spite of comparative failures of the rice crop this district escaped the famine or scarcity which affected other districts less favourably circumstanced.

Famine of 1770.

Of the great famine of 1769-70 there are no detailed records to show the extent to which this district suffered; we know, however, that Birbhum in which, so far as the district was under British control, the area of the present district of Manbhum was for the most part included, suffered extremely and the description given of the state of that district in 1771 "many hundreds of villages are entirely depopulated, and even in the large towns not a fourth of the houses are inhabited" probably applied to the northern part of Manbhum with equal accuracy In Birbhum district as then constituted there had been close on 6,000 villages under cultivation in 1765, three years after the famine there were little more than 4,500. So far as we know now this famine was due to the failure of a single crop, the rice crop of December 1769, following on a comparatively short crop the year before; its intensity was due to the failure being wide-spread, extending over the greater part of Bengal and Bihar, and to the entire absence of easy communications.

Famine of 1866

Nearly a hundred years passed before any scarcity resulting in serious famine occurred, though in the intervening period there were years of short crops and presumably considerable distress; partial droughts affecting particular areas only have been numerous, and in 1851 there was a more or less general drought and failure of the rice crop, but not such as to result in famine. The immediate cause of the famine of 1865 was the excessive rain in the earlier part of the monsoon period which hampered agricultural operations and ruined the *bhādoi* crop, followed by a sudden and early cessation which spoilt the prospects of the main winter crop. There were besides predisposing causes; the harvests of 1863 and 1864 had been below the average, and the cyclone of the latter year, though it did not reach the Mānbhum district, led to exportation to an unusual extent, and stocks of grain were consequently already depleted, or at any rate unusually low at the time the new crop should have come into the market.

So early as the end of October 1865, a petition was presented to the Deputy Commissioner, praying that exports might be stopped and the price of the rice fixed; and in November he issued a notice to the zamindars recommending them to use their influence to check the export of rice. The outturn of the winter crop all over the district was estimated to have been between one-third and one-half of a full crop; but in a considerable tract towards the south-east the yield did not exceed one-fourth. On the 15th of March 1866, the District Superintendent of Police reported a great increase of robberies and dacoities, particularly in the southern and eastern parts of the district. "That these were largely due to scarcity was proved by the fact that the property stolen consisted of nothing but eatables, any valuables in the houses broken into being left as useless. Unhusked rice was selling at 18 or 20 seers for the rupee, husked rice at 8 and 7 seers, and it was reported that not only the very poor but even the more respectable natives had been forced to eat mahua and the like; numbers of the people were said to be actually starving, and subsisting on grass or anything they could get." In the middle of May the Deputy Commissioner called a meeting to devise measures for the relief of the distress, and asked the Commissioner of the Division to cause subscriptions to be raised in other districts, and to apply for a grant of money from Government. Colonel Dalton, however, while approving of the meeting, considered that there was no occasion for relief by distribution of food. Prices, he observed, were lower in Mānbhum than in other districts of the Division; and the robberies, cited in evidence of the distress, were committed for the most part by the landless low castes of semi-Hinduized aborigines, who gain but a precarious livelihood in ordinary years. This class, Colonel Dalton was of opinion, could best be dealt with by encouraging them to emigrate, and by establishing relief works for their employment. A letter from the Commissioner of Burdwan, reporting that the villages of Midnapore bordering on Mānbhum were threatened by armed gangs of Sonthals belonging to the latter district, had previously been forwarded to the Commissioner of Chota Nāgpur, who replied that although some Bāuris (not Sonthals) had committed numerous grain robberies, no disturbance had taken place with which the ordinary police were unable to cope, and that the inhabitants of both Mānbhum and Singhbhum were bearing up very well against the difficulties. Both at this time and later in the year, the Deputy Commissioner replied to Colonel Dalton's argument, that there could be no distress with rice selling at 14 seers to the rupee, by pointing out that in the interior of the district all transactions were carried on by barter, and that the recorded market price was therefore no criterion of the supply of grain. Even dealings by barter in open market were now uncommon, and in Raipur (now included in Bānkura district) there were no transactions in the markets, and no rates of price could be reported. Money, in fact, was so little used, that the copper coins received at the Treasury from Calcutta never passed into circulation at all. During May grain robberies increased more particularly in the south-east of the district and even the Commissioner was at last satisfied that some relief measures were necessary. Relief works were opened by the District Committee in the most distressed portion of the district, *i.e.*, the eastern thanas, and in June, when a grant of Rs. 2,000 was received from Government, depots for gratuitous relief were started in the south of the district. Up to the 5th of June, employment had been provided for 1,000 persons daily, and gratuitous relief for 450. Distress, however, continued to increase all along the south of the District; the price of rice rose in Barábhum from 11 to 9 seers for the rupee, and grain robberies were occurring at the rate of four every night. The Relief Committee, therefore, applied for a further grant from Government, and the Deputy Commissioner reported that the ghātwali or rural police were wholly dependent on the produce of their lands, and that an outbreak might be expected unless their subsistence was provided for. In the meantime, a depôt for gratuitous relief was opened at Purūlia and placed under the charge of Mr. Onasch, a Lutheran missionary, as Secretary to the Relief Committee. With the opening of the grain depôts in the south of the district there was a marked decrease in the number of gang robberies, but distress now began to spread towards the north, and on the 25th of June a sudden rise in the price of rice from eleven to seven and-a-half seers for the rupee was reported from Gobindpur. At this time Mr. Onasch, visiting the south-eastern portion of the District, found the people living on the seeds of the *sál* tree, on the chaff of rice, on oil-cake, and other less nutritious substances. Deaths from starvation had occurred in many places; the money paid as wages remained unused; no rice was to be bought; land which was ordinarily cultivated had been left fallow for want of seed; and in some villages the recruiters for emigration had aggravated the distress by taking away the men, and leaving the women and children destitute. Payment in grain instead of money was now commenced wherever such an arrangement was possible, arrangements being made to import grain from Calcutta. The Board of Revenue sent up 5,000 maunds of rice in the beginning of July, but a large amount of it was damaged in consequence of the absence of any facilities for storing at the Barakar station. Only a few carts could be procured, floods in the Dāmodar cut off communications, the roads were impassable from heavy rain, with the result that it was nearly 2½ months before the last of this consignment actually reached Purūlia. In fact, as the Famine Commissioners remarked, the isolation of Mānbhum, when once the rains had set in, was nearly as complete as that of Orissa itself. All through August, distress and mortality continued to increase, and at the end of that month rice was selling in Purūlia at the rate of from four to four and-a-half seers per rupee. Further south the state of things was worse only three and-a-half seers being procurable for the rupee, and the people had eaten much of the early rice crop in the field before it attained maturity. The prospects of the later crop were good, but only one-third of the usual area had been sown, stocks in the district were exhausted, and the Deputy Commissioner urged the necessity of importing more rice from Calcutta. But the worst was now over and though no more grain was actually sent from Calcutta it was reported on the 11th of September that distress was decreasing, although deaths were still very numerous in the south-east of the district. During that month ten new centres were opened by the Committee, but by this time the prospects of the late crop were secured, and the early rice which was now in the market began to reduce the rates. Thus, in Purūlia, rice was selling at 16 seers for the rupee; and on the 31st of October an order was passed that every man should be sent from gratuitous relief to the relief works as soon as he was capable of labour. On the 3rd of November rice was selling at 20 seers for the rupee, and distress rapidly decreasing. As the main crop was coming in, the Deputy Commissioner issued a notification to the landowners, pointing out to them the importance of leaving the crop of 1866 in the hands of the peasantry and not sweeping it away by distraint for arrears of rent. The landowners were also requested to explain to their tenants that a grain merchant has no right of distraint, except under the decree of a Court, and that cultivators were not bound to repay advances out of the crop of the current year. On the 14th of November a further grant of Rs. 8,000 was received from the Calcutta Relief Committee, and on the 16th the District Committee began closing all depôts where the number of applicants fell below 50. By the end of November, depôts were being rapidly closed all over the district. But the Deputy Commissioner anticipated that distress would continue for some months in the wilder tracts, where, owing to the absence of tanks and means of irrigation, nearly two-thirds of the crop of 1865 had been lost; while for want of seed little more than one-third of the available land had been sown in 1866. In these tracts, therefore, about twenty relief centres were kept open till the middle of December.

The total daily average number of persons relieved in each month in Mânbhum is reported by the Famine Commissioners as follows:—June, 322; July, 1,303; August, 2,924; September, 5,824; October, 9,950; November, 4,252; December, 1,988. Daily average from June to December, 3,794. Besides this, four depôts for the distribution of relief were opened and supplied by private persons at Pāndra, Jharia, Katras, and Barākhar, where large numbers were fed. The total sum expended on relief amounted to Rs. 76,360 of which Rs 43,346 was granted by the Board of Revenue, Rs. 28,200 including grain to the value of Rs. 5,000 by the Calcutta Central Relief Committee, and Rs. 4,814 was raised by private subscriptions. To this has to be added Rs. 25,346 being the cost of grain supplied from Calcutta by the Board of Revenue. The total cost of famine operations was, therefore, rather more than one lac of rupees. The report of the Famine Commissioners describes the distress in Mānbhum District as having been "severe" over an area of 2,318 square miles, and "intense" in a smaller area of 1,500 square miles, the total area included in the district as then constituted being 5,400. These areas are, however, only approximate. The famine was most severe in the Fiscal Divisions of Barābhum, Mânbhum and Raipur, in the south and south-east of the district; and diminished in intensity north of a line drawn from east to west almost through the civil station of Purūlia.

Of the mortality directly or indirectly due to this famine there have been various estimates; the figures finally accepted by the Commissioners were based on a detailed enquiry made in particular areas by the Deputy Commissioner, and inferences drawn from the census figures of 1872. According to this out of an estimated population of just under a million in 1865 no less than one-fifth perished either of starvation or disease, a percentage that can only have been possible if as was stated at the time the deaths in Barabhum and other severely affected parts amounted to one-fourth or even one-third of the population.

Famine of

The circumstances preceding the famine of 1874 were not unlike those preceding the one just described; the year 1872 was not altogether a favourable one; in parts of the district, especially in the eastern Pargana of Mānbhum, the main rice crop was almost a total failure, and for the whole district the estimated outturn was only five eighths of a full crop; as a small set off against this the rabi crop was almost uniformly good. In 1873 conditions were even more adverse; the rains were late in commencing, only 2·21 inches falling in June as compared with the normal fall of 8¾ inches; in July the fall was excessive, amounting to no less than 20½ inches as compared with 12½ normal, and over a large part of the district the rains almost entirely ceased in the month of August, the September fall at Purūlia being only 3 inches and the October fall a barely measurable quantity as compared with 7 inches and 4½ inches for the two months in normal years. The result was a crop estimated at only half the normal for the district as a whole, varying from four to six annas in the centre to nine or ten annas in the more favoured parts in the west. The outturn generally was slightly better than in 1865, but on the other hand the succeeding rabi crop was a smaller one, the area under cultivation being reduced to a minimum by the absence of moisture and of water in the reservoirs due to the early cessation of the rains. As in the earlier famine year there was at first a considerable drain on the district resources in the shape of export to other distressed regions; the local stocks must, however, have been considerable as the price of rice rose only from 15½ seers in January to 13 seers in April when Government importations had already begun to arrive, and it was not till March that distress began to make itself shown among the beggars and those who in ordinary times subsist on private charity. During April the ripening of the *mahua* harvest prevented a further increase of distress, the *mahua* blossoms affording cheap food to the poorer classes. To quote the Deputy Commissioner's words, "had it not been for this very timely supply of food, great distress, if not actual starvation, would ere this have taken place." In addition to the *mahua* harvest the spring crop of lac came in at this time, and as the lac market was favourable to sellers, this was also a material aid to the people, lac exchanging locally at the rate of one seer of the dye for three seers of rice. Meantime relief works had already been started on small scale in February; in March the average daily attendance had risen to over 3,000 and in April the numbers mounted up rapidly, the average attendance for that month being over 10,000. By the time May came the area affected had greatly increased and included parts of the district till then comparatively well off. In the areas in which mahua trees were few in number cases of distress were numerous and on the increase, and the circle of distress generally had widened, so as to include the smaller cultivators as well as the mendicant and labouring classes. Even the south of the district, where the harvest had been better than elsewhere, had now begun to feel the pinch, prices then having levelled up owing to continued exportation. Thus by the middle of May the numbers on relief works had mounted up to nearly 14,000 besides nearly 6,000 receiving gratuitous relief, either in doles of dry grain or at the famine kitchens. The numbers on relief works reached their highest in the following month during which an average of over 14,000 were so relieved; but with the opening of the rains there was a rapid fall to slightly over 8,000: in August the relief works ceased to attract more than 800 a day and in September they were closed entirely. The departure of the able bodied, however, to ordinary field labour did not for some time relieve the district authorities of the necessity of feeding their dependants, and the number gratuitously relieved mounted up rapidly till it exceeded 20,000 in the middle of July, and nearly 22,000 in the early part of August and between that date and the first week of October between 13,000 and 9,000 were relieved daily. By that time the *bhādoi* crops were coming into the market, the prospects of the rice crop were more or less assured, and the price of rice, which owing to the large importations had never been higher than 13 seers for the rupee (in July), was steadily falling and the necessity for continuing further relief operations had gone. With the advent of the first of the new crop in the market prices quickly fell in November and December to 22 and 24 seers which had been about the average rates during the year 1872, and any cause for further anxiety had entirely passed away.

The largest number of people in receipt of relief at any one time, *i. e.*, rather more 28,000 in July, represents less than 3 per cent. of the district population, and the average number relieved during the 7 months, in which operations were in full swing, was less than 2 per cent. The total cash expenditure was Rs. 2,67,641, besides 8,830 tons of grain, the cost of which to Government it is almost impossible to estimate but which cannot have been less than 8 lakhs of rupees. The actual cost of relief measures was thus over 12½ lakhs of rupees as compared with three-quarters of a lakh expended in 1866. Of this amount, however, Rs. 99,000 represents loans made in cash, and approximately Rs. 5,30,000 advances in grain or 6¼ lakhs in all of which 4¾ lakhs were subsequently recovered. The net famine expenditure was, therefore, about 7¾ lakhs.

As the Famine Commissioners of 1880 remarked of Bengal general the immunity from mortality due to starvation was dearly purchased, and the means employed were entirely disproportioned to the end. At the same time it is hardly possible to endorse the view in the case of Manbhum that the policy of importation of grain was a mistaken one. Communications had not improved materially since 1866, Barakhar was still the nearest railway station and cut off from the greater part of the district by the river Damodar, and it is conceivable that had exceptional steps not been taken to import grain in large quantities before the rains began, the experience of 1866 might well have been repeated in the remoter parts of the district. On the whole the measures taken, though possibly exceeding what was really necessary, were on sound lines.

Scarcity in 1892.

Rainfall in 1892 was deficient and badly distributed and in consequence the outturn of both the autumn and winter crops was poor, viz., 12 and 10 annas respectively. In the previous year also there had been below the average and prices had generally risen. The district was, however, just then being opened out by railways, the mining industry was also beginning to develop, and in consequence the demand for labour was considerable. Though, therefore, there were some distress in places the year can hardly be classed as one of anything more than partial scarcity, and nothing in the way of relief measures was necessary.

Famine of 1897.

The next and most recent year of famine was 1897 and, as in the two previous cases, the cause lay in a succession of bad seasons rather than in a single failure of the crops. In 1895-96 the district rainfall was only 35·77 inches as compared with a normal fall of 53·27 inches, and though the *bhadoi* crop was an average one, the winter crop amounted to only five-eighths of the normal. The succeeding spring crop was rather better, average thirteen-sixteenths, but this is at the best a very small crop in Mānbhum. The result was that prices had begun to rise as early as the beginning of 1896, and by September had risen to 14 seers at Purūlia and 11 at Gobindpur. The rainfall of 1896-97 was only slightly heavier than that of the previous year, and its distribution could hardly have been worse. In the Sadar Subdivision only 1½ inches were received in May after an absolutely dry April with the result that preparation of fields and the sowing of the seed beds were seriously delayed. The next two months conditions were more or less normal, but in August only 9½ inches fell as compared with a normal of nearly 14, and the September fall was less than half the normal. In the Gobindpur (Dhanbaid) Subdivision conditions were rather more favourable in May and June, but in the two succeeding months the rainfall was in marked defect. The fall in September was over 7 inches but most of this fell in the early part of the month; in both Subdivisions October was absolutely rainless. The result was that the outturn of *bhādoi* crops was only half the normal, and of winter rice even less, 7 annas for the district as a whole, and in parts of the district no more than 4 annas The very early cessation of the monsoon was not compensated for, as in parts of Bihar, by favourable cold weather rains and the consequence was that the rabi crop of 1897 was almost an entire failure, the outturn being estimated at 3½ annas only. To add to the misfortunes of the District the *mahua* crop, which is largely consumed by the lower classes, was seriously damaged by untimely rain in March 1897. By January of that year it was evident that severe distress, if not actual famine, was probable, and preliminary arrangements for the organisation of relief measures had been put in hand Prices had by this time risen to 10 seers at Purūlia and 9 at Gobindpur, and gratuitous relief to beggars and wanderers was necessary. By the third week of February gratuitous relief was being administered to nearly 4,500 persons and the test works opened in Gobindpur, Tundi, Chás and Jhalda earlier in the month were being attended by another 3,000. During March and April the area treated as affected gradually widened until it included the whole district, except thanas Mānbazar and Barābazar in the east and south, and at the end of that month though the numbers of relief works had only increased to 4,000, those on gratuitous relief had mounted up rapidly to over 12,000. The price of rice had risen to 8¼ seers per rupee in April, and by the end of May only 7⅝ seers were obtainable at Gobindpur and slightly more at Purūlia, and at this level or slightly lower prices remained during the two succeeding months, reaching as high as 7 seers per rupee at Gobindpur towards the end of the latter month. During May and June the numbers on relief works increased but slightly, the ordinary field work of the season being then in full swing and stricter scrutiny of the applicants for gratuitous relief had brought down the numbers so relieved to a little over 7,000. From then onwards there was a rapid increase, the average attendance on relief works in July being 8,508, and in August 10,759, the figures for the last week of that month being as high as 16,388 An attempt was then made, as in other districts of the division, to summarily close down all forms of relief other than kitchens, granting two weeks gratuitous relief to each worker and to the recipients of grain doles. The attempt was, however, premature as the early *bhādoi* crop, consisting of *gora* or *sāthi* rice, maize, *marua*, etc, is a comparatively small crop, and the main rice harvest, even that part of it which is classed as *bhādoi*, does not begin till November Both works and gratuitous relief centres were, therefore, opened *again after* a few days interval under the Commissioner's orders and the numbers on relief works had again risen to over 13,000 by the end of September, at which time over 3,000 persons were still in receipt of gratuitous relief Prices were, however, by this time steadily falling and the prospects of the new crops assured, and at the end of October, though 9,000 persons were still on the works and 2,000 in receipt of other forms of relief, the operations were finally closed.

The total area affected was 3,373 square miles in extent with a population of 991,000, the average number under relief during the six months, when the distress was at its worst, was 14,162 representing 14 per mille of the population: the largest number relieved at any one time, *i.e.*, the last week of August was 23,696, or rather less than 2½ per cent. The total expenditure incurred from public funds was Rs. 2,80,177, besides Rs. 42,093 and 40,052 (partly from public funds and partly from the Charitable Relief Fund) paid out in advances under the Land Improvement and Agriculturists' Loans Acts respectively. From the Charitable Relief fund also Rs. 31,500 was expended in advances and gifts for seed to cultivators, some Rs. 10,000 in valedictory doles to the relief workers and recipients of gratuitous relief, and the remainder on general relief.

One of the most interesting features of these operations was the successful organization for the relief of weavers in the north of the district by Dr. A Campbell of the Free Church of Scotland Mission at Pokhuria where, apart from other forms of relief, there were at one time between 1,300 and 1,400 persons engaged in spinning and some 200 others in weaving. The cost of these operations was shown at Rs. 5,462, viz., Rs. 2,220 spent in materials and Rs. 3,242 paid in wages, the estimated value of the cloth received being Rs. 2,395. Dr. Campbell's services as an Honorary Circle Officer can hardly be spoken of too highly. His charge extended over what the Commissioner in his report states to have been the only part of the division where general distress in anything approaching an acute form of famine can be said to have existed, and the same officer remarked that "from the point of view of relief administration Dr. Campbell's arduous and unostentatious work in Pokhuria was a performance of the highest merit, and will long be held in grateful memory by the people of the neighbourhood.' Dr Campbell's services were acknowledged by the bestowal on him of the Kaisar-i-Hind medal and those of the District Engineer, Babu Nanda Gopal Banerji, on whose shoulders fell the whole of the organisation of the relief works, by the grant of the title of Rai Bahadur.

Mortality due to actual starvation was successfully avoided but the extremity of distress was marked by a very high death rate, the rate for the months, June to September being 15½ per mille as compared with 9½, the average for the corresponding period of the five preceding years. This excessive rate was due largely to a severe epidemic of fever but that the general health of the district considerably deteriorated is shown by the fact that 66 per cent. of persons admitted to the jails during the months April to October 1897, were classed as in bad or indifferent health as compared with only 24 per cent. in the previous year Other indications of the extent of the distress were the large increase in dacoities and burglaries, from 9 and 426 respectively in 1896 to 34 and 1,179 in 1897, and in the increase of registered emigrants from 1,073 in 1896 to 4,776 in 1897

In contrast to previous famines nothing was done to import or encourage the importation of grain from outside, or from one part of the district to another; exports practically ceased in 1897, in which year, instead of an excess of exports over imports amounting to over 80,000 maunds in 1895 and 5,000 maunds in 1896, there was an excess of imports of nearly 209,000 maunds, a fact which at once proves that the deficit in the district was considerable, and that private trade was quite able to make it good. Communications had, of course, greatly improved since 1874 but it may well be borne in mind that neither the Grand Chord of the East Indian Railway nor the Purūlia-Ranchi branch of the Bengal-Nāgpur Railway were even projected till a much later date.

Distress in 1908.

Since 1897 there were comparatively short crops in 1904-05, 1906-07 and 1907-08 and in the last year the situation was one which gave rise to considerable anxiety, owing to the previously unparalleled prices to which food-grains rose almost generally throughout the district, and more particularly in the parts more remote from the railway. As early as October 1907 the price